Railway Age Gazette

PUBLISHED EVERY FRIDAY AND DAILY EIGHT TIMES IN JUNE BY THE
SIMMONS-BOARDMAN PUBLISHING COMPANY
WOOLWORTH BUILDING, NEW YORK

CHICAGO: Transportation Bldg. CLEVELAND: Citizens' Bldg.
LONDON: Queen Anne's Chambers, Westminster.

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Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico.....$5.00
Canada 6.00
Foreign Countries (excepting daily editions)..... 8.00
Single Copies.....15 cents each

Engineering and Maintenance of Way Edition and four Maintenance of Way Convention Daily issues, North America, $1.00; foreign, $2.00.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

WE GUARANTEE, that of this issue 9,050 copies were printed; that of these 9,050 copies, 7,375 were mailed to regular paid subscribers to the weekly edition, 250 were provided for counter and news companies' sales, 1,185 were mailed to advertisers and correspondents, and 240 were provided for samples and office use; that the total copies printed this year to date were 175,800, an average of 9,257 copies a week.

VOLUME 56 MAY 8, 1914 NUMBER 19

Contents

EDITORIAL:
Editorial Notes 1013
Mr. Brandeis' Brief and Argument..... 1014
Tips versus Wages 1015
The Country Waiting Room 1016
New Books 1016
LETTERS TO THE EDITOR:
Perpetual Economy Discovered..... 1017
What Can a Pensioner Do With Himself?..... 1017
Keeping Passenger Stations Presentable 1017
MISCELLANEOUS:
*Economical Locomotive Performance on the Frisco..... 1018
*William G. Besler 1022
U. S. Government Railroads 1022
Mr. Brandeis' Brief and Railroad Rebuttal in Rate Case..... 1023
*Standard Freight Bill 1026
*Articulated Locomotive With One Engine on the Tender; by R. S. Mounce 1027
*Rebuilding 275 Miles of Milwaukee's Line in Iowa..... 1031
The Economic Transition; by Logan G. McPherson..... 1036
Promotions on the Canadian Pacific..... 1038
*New Blue Print Machines 1039
*The G-E Vacuum Lightning Arrester..... 1040
*The Schraeder Pit Loader for Locomotive Coaling Stations..... 1040
GENERAL NEWS SECTION 1041

*Illustrated.

Two railway commissions recently have intimated that they regard with disfavor the "fancy" salaries paid to some railway officers. It is true that large salaries are paid to some railway officers. But these large salaries are not paid because the directors are wasteful. They are paid because the competition between different roads for the services of men of demonstrated capacity is often so keen as to force to a high point the amounts that the roads with which they are connected must pay to hold them, or that the roads which wish them must pay to get them. The number of large salaries paid on the railways of the United States is, however, relatively few—so few, in fact, that the average salaries paid to officers are surprisingly small. The statistics of the Interstate Commerce Commission show that in the fiscal year ended June 30, 1911, the railways of this country had 5,628 "general officers" to whom were paid salaries aggregating $18,300,523, an average of $3,251 per year. They also had 10,196 "other officers" to whom were paid salaries aggregating $21,563,742, or an average of $2,115. These figures tend to support the view generally held by railway officers that for corresponding positions the salaries paid by railways are smaller than those paid by other commercial concerns. Furthermore, the average salary of general officers, unlike the wages of railway employees, shows no tendency to increase, it being in 1910 $3,277, or larger than it was in 1911. As a means of controlling the expenses of railways an attempt on the part of commissions to meddle with the salaries they pay would be about the most foolish and futile thing that they could do.

The "Fancy" Salaries of Railway Officers

The action of the eastern railways in filing with the Interstate Commerce Commission tariffs providing for a charge for "spotting" cars brings the issue squarely before the Commission in such a way that it would seem impossible to make it a factor in the decision in the advanced rate case, unless that decision is to be long delayed. The "spotting" tariffs are effective on May 27, by which time the Commission will hardly have decided the big case. If they are to be suspended they must be suspended at once, which would seem to mean that the Commission cannot sustain Mr. Brandeis' position without taking the time to conduct a far-reaching and protracted investigation of the entire question of a charge for service on private side tracks. Mr. Brandeis, while admitting that the revenues of the eastern carriers are inadequate, has insisted that they be increased without a straight advance in rates, by the elimination of special allowances and so-called free services to shippers. The Commission has indicated that it would increase the railways' earnings by eliminating tap-line and industrial allowances, but cancellations of such allowances have been suspended and the tap-line case is still in court. To decide now that the railways need more revenue while denying them an advance in rates on the ground that they might hope for increases from tariffs under suspension, would be inconsistent, indeed. The railways are not especially keen for a spotting charge, but they are not particularly desirous of being advised to improve their credit and pay their increasing bills with stage money.

Spotting Charge Tariffs

The ease with which many persons can make themselves believe whatever they wish to, regardless of facts and logic, is truly very remarkable. All over this country there are men, newspapers and magazines that daily inveigh against the municipal, state and national governments for incompetency and ignorant or culpable disregard of the interests of the public. They denounce their city governments for the inefficiency and grafting of their police departments and for being dominated by bosses. They denounce their state governments for not passing legislation to remedy the slow procedure of the courts, or because, as recently in West Virginia and Colorado, they fail to deal fairly or to deal effectively with labor conditions and lockout and strike outrages. They denounce the federal government because, as some say, the passage of the Panama canal act was a violation of a treaty solemnly entered into, or, as others say, because the legislation now proposed to repeal that act would be a cowardly surrender to John Bull, and they denounce it for pork-barrel legislation, for failure to solve the trust problem, for failure to have the army and navy in a state of preparedness to deal with such crises as that in Mexico, and so on. Having thus established the utter incompetency and immorality of practically all the governments of the country, great and small, their failure to perform their primary duties, their utter disregard of the public interests, the same men, newspapers and magazines swiftly wheel about and advocate municipal and government ownership of public utilities,

On the Efficiency and Public Spirit of Governments

telegraph and telephone systems, coal mines and railways on the theory that in managing them the governments would be eminently efficient and would be influenced by no consideration except the public welfare. People who can start from such premises and arrive at such conclusions have heads made of ivory of a rare degree of solidity.

MR. BRANDEIS' BRIEF AND ARGUMENT

THE brief submitted to, and the argument made before, the Interstate Commerce Commission in the eastern rate advance case by Louis D. Brandeis are characteristic expressions of this most interesting, able and public-spirited man. This is especially true of the brief. Well written, showing its author's broad familiarity with social and industrial conditions, but subtle, elusive and inconclusive, one who is familiar with railway conditions reads it with pleasure and admiration, is impressed by many points made in it, and yet is obliged to decide that its author's knowledge of the railway situation is that of the able lawyer who has crammed for the purposes of a particular case, and to differ widely from the general conclusions reached by him.

Net Return Inadequate.—Mr. Brandeis gives numerous statistical tables which show that the net earnings of the eastern railways always have been, and are now, moderate; that those of the so-called Central Freight Association lines have been, and are, entirely inadequate; and that the tendency of net return is downward. Some of the eastern roads, especially the anthracite-carrying lines, do not need higher rates; but the figures clearly demonstrate, and Mr. Brandeis admits, that most of the railways involved in the case do need them. Mr. Brandeis' figures show that after paying operating expenses, taxes and fixed charges, the Official Classification roads, which are the most prosperous roads in the territory, had left net corporate income which averaged in the ten years 1903 to 1912 7.96 per cent. on their capital stock; in 1910, 9.7 per cent., and in 1913, 8.07 per cent. The Central Freight Association lines' net corporate income in 1903-1912 was 2.65 per cent.; in 1910, 3.13 per cent., and in 1913, .54 per cent. The total income—income left after paying operating expenses and taxes—of the Official Classification roads in 1903-1912 was 6.12; in 1910, 6.7, and in 1913, 6.11; while that of Central Freight Association lines in 1903-1912 was 3.59 per cent.; in 1910, 3.63 per cent., and in 1913, 2.70 per cent. The ratio of the net operating income of the Official Classification lines to their property investment in 1903-1912 was 5.71; in 1910, 6.28; in 1913, 5.36; while that of the Central Freight Association lines in 1903-1912 was 3.89; in 1910, 4.06, and in 1913, 3.09.

"Conservation" of Railway Revenues.—While conceding that most of the railroads in the territory are not earning enough to give satisfactory service and properly develop their facilities, Mr. Brandeis opposes the so-called "horizontal" increase of 5 per cent. on various grounds. One of these is that the railways dissipate their revenues by rendering many terminal services free, by paying shippers for rendering some services which the shippers should render to themselves, and by failing to make adequate charges for many of such services. There is much merit in this contention; and the eastern railways have met the issue squarely. They have filed tariffs fixing charges for these various services; and if the Interstate Commerce Commission allows these to go into effect they will benefit the roads materially. But when Mr. Brandeis says that by the conservation of their revenues in the ways he mentions the eastern railways could increase their net revenues much more than $50,000,000 a year, he asserts what neither he nor any one else can prove. His "estimate" is the merest guess. The railway managers are equally entitled to guess; on this subject they are sure to be better guessers than Mr. Brandeis; and they guess that Mr. Brandeis' estimate is extremely excessive.

Inadequate Mail Pay.—The special counsel for the commission discusses at length the compensation being paid by the government to the railways for carrying the mails, and accepts the view of the railways that it is inadequate. This suggests to him a source from which the railways should get part of the additional revenues that they need. But, of course, Mr. Brandeis does not here give the railways new information. They knew already that their compensation for carrying the mail was inadequate. What they want to know is how they can get the government to put the mail compensation on a reasonable basis; and on this point Mr. Brandeis, despite his famed resourcefulness, has no suggestion to make.

Unremunerativeness of Passenger Business.—Mr. Brandeis also makes an elaborate comparison between freight revenues and expenses and passenger revenues and expenses, and concludes that, generally speaking, the passenger business contributes practically nothing to net earnings. He, therefore, suggests that it would be more fair and expedient to increase the remunerativeness of the passenger business than to advance freight rates. Here, again Mr. Brandeis gives the railways no help. They know, and have long and insistently pointed out, that their passenger business is unremunerative. In spite of all that, state legislatures and commissions have persistently reduced and held down their state passenger rates and the roads have had to reduce their interstate fares to the same basis as their state fares. What remedy for this has Mr. Brandeis to offer? None whatever.

Efficiency of Railway Operation.—In the hearings on the rate advance cases four years ago Mr. Brandeis sought to show that the railways' operating expenses were higher than need be because of inefficient management. He tries again in this case to show the same thing, although with different arguments and a very palpable decline of confidence in the strength of his position. This time he says nothing of "scientific management," which four years ago he tried to show could save the railroads a million dollars a day. He now says that gas, electric light and other public utility companies and manufacturing concerns have been confronted with the same conditions as the railways, and that by efficient management the public utilities have overcome them while actually reducing their rates. The analogy here instituted is valueless. The public utilities, being usually monopolies, did not have their rates enormously reduced by cut-throat competition as the railways did up to 1899. As a result of these competitive reductions of their rates the railways became unable to pay any dividends whatever on 70 per cent. of their outstanding stock. If the reductions in their rates since 1900 have not been as great in proportion as those of public utilities—and the few specific examples of public utilities which have reduced their rates which Mr. Brandeis cites really prove nothing—it has been chiefly because the enormous reductions made before that time rendered it necessary, if the roads were to come out of bankruptcy, for them to use their resources both to maintain their rates and to increase the efficiency of their operations. As to the manufacturers, everybody knows they have greatly increased their prices.

Mr. Brandeis cites some statements made by Col. Goethals regarding economies effected in fuel consumption and in the use of lubricating oil on the Panama Railroad as examples of what might be done on the railways of the United States. This moves to cachinnation everybody familiar with the results of the operation of the Panama Railroad. There are innumerable railways in the United States which can show that in respect of this or that feature of their operations they have made economies which by comparison cause those cited on the Panama Railroad to appear trifling. There is never a week when the *Railway Age Gazette* does not cite examples of this sort. But on a railroad it is the outcome of all the work done in the operating department that counts. Now, the operating expenses of the Panama Railroad in 1913 were $44,697 per mile. The only railway in the United States with equally large operating expenses is the Pittsburgh & Lake Erie, whose average was $45,028 per mile. What were the relative amounts of services rendered for these expenditures? The Panama Railroad rendered 562,199 passenger miles and 1,301,088 ton miles of service per mile, while the Pittsburgh & Lake Erie rendered 415,265 passenger miles and

10,336,939 ton miles of service per mile! Comment on these figures is unnecessary. Another point which Mr. Brandeis seems to have overlooked is that the reports of the Panama Railroad show that the amount of fuel consumed in its locomotives was 20 per cent. greater in 1913 than in 1912, although the number of locomotive miles run in 1913 was 10 per cent. less than in 1912!

As an authority on railway efficiency, Mr. Brandeis always was a fizzle, and he does not improve. The implication throughout his brief is that the railways could operate their properties more economically. Nevertheless, he concludes that they must in future spend more rather than less for maintenance of way and maintenance of equipment, and that they have shown great efficiency in dealing with their transportation expenses. If they have shown great efficiency in holding down transportation expenses, and they cannot hope to reduce their maintenance of way or maintenance of equipment expenses, in what department, since these three classes of expenses constitute 94 per cent. of all their expenses, are they to make those large economies in operation which to Mr. Brandeis' oriental imagination appear so perfectly feasible?

The Railways' Need for Early Relief.—In the argument at Washington on Friday Mr. Brandeis, believing that the roads not only need larger revenue, but should be encouraged to accumulate a good business surplus, contended that there is no such pressing need for immediate relief as the railroad managers have tried to show. In Mr. Brandeis' opinion, the railroad managers, and with them public opinion pretty generally, have been stampeded by that doubtful friend of the railroads—Wall Street—into a state of panic which has no foundation in fact. Mr. Willard, with all the transparently honest conviction that makes him so highly respected not only by all those on the railroad side of the controversy, but equally so by those on the other side, took exactly the opposite view. In Mr. Willard's opinion the need for increased revenues is a practical, insistent, imperative need about which there is no more necessity for hysteria than there is about any of the other great issues of life; yet it is not the less momentous. As a practical man and as one of the greatest authorities on the subject in the United States, Mr. Willard could see no other way so satisfactory, of raising the credit of railroads, of putting a check to a situation which is becoming more manifestly deplorable every day, than of increasing horizontally freight rates in official classification territory by 5 per cent.

There was an unconscious contrast made between Mr. Willard and Mr. Brandeis which if it did not occur to the principals must have occurred to many others in the hearing room who had followed the case with understanding. Mr. Brandeis, in his remarkably able final oral argument, was the critic, the theorist, the keen analyst, the idealist. His success in life has been made by the exercise of these qualities acting on the work of other men. He is the non-producer. Mr. Willard has spent a life of doing; to produce and to create it has been necessary for him not only to analyze a problem but to find a solution for it. His province has been not to show that with the proper toil five blades of grass could be made to grow where one is now growing, but to toil so that two blades of grass actually are growing now where one grew before. Mr. Willard in expressing the view that he did has been backed up by Mr. Rea, Mr. Delano and others who are experts on their subject as a result of having devoted their lives to the railway business. Will the commission and the public accept the view of Mr. Brandeis who, able and conscientious as he is, is a lawyer and theorist, or of those who have devoted their entire lives to the study of science and to the practice of the art of transportation?

An Important Legal Question.—Both in his brief and in his oral argument Mr. Brandeis, with all the forcefulness of his extraordinarily forceful personality, warned the commissioners that in his opinion if, after having suspended each one of the tariffs separately they should, without being convinced that each one of the increases involved in the tariffs which had been suspended, was reasonable, permit these increases to go into effect, they would be committing an unlawful act against which appeal could be taken to the courts. According to Mr. Brandeis' interpretation of the amendment to the Interstate Commerce act, the burden of proof imposed on the railroad is to justify a rate increased or sought to be increased, and proof that the present rate is not reasonable is not proof that the increased rate is reasonable. On this point Mr. Patterson took an exactly opposite view; and to sustain his position he quoted unmistakably clear passages from former decisions of the commission. The commission on this point, therefore, is faced with the necessity of accepting Mr. Brandeis' interpretation of the law in exact opposition to its own former interpretations of the law or of rejecting the view of the law expounded by its counsel.

TIPS VERSUS WAGES

THE California railroad commission, which has just completed an investigation of the rules, regulations and practices of the Pullman Company, expresses indignation that the company should "stoop to the disreputable practice" of paying its employees so little that they are dependent largely upon tips; or, as the commission puts it, upon the "generosity" of the public; and that it "forces its patrons to be generous or not get service." The commission voices the feelings many people entertain for the whole tipping system. Many have long recognized that the whole system is an abomination; that it is not only degrading, but inefficient for the purpose for which it is intended; but, nevertheless, the people submit to it, and even encourage it, in Pullman cars, hotels, restaurants, barber shops and elsewhere. But probably more have felt resentment at being forced to be "generous" without getting or wanting service, than at being compelled to tip to get service.

Tips are given for a large variety of reasons, of which generosity is one of the most negligible, in Pullman cars as elsewhere. To say that it is no more compulsory to tip in a Pullman than elsewhere is not sufficient because, as everyone knows, there are so many ways in which the non-tipper can be made uncomfortable that as a practical matter it is far easier to tip not only the porter, but also the waiter, bell-boy, barber or bootblack, than not to tip. The average man would far rather pay enough for service to justify the employer in paying adequate wages than to tip. Presumably the average servant would prefer to be paid an adequate and certain wage than to be dependent on uncertain tips. But, unfortunately, the ideal condition is always being destroyed or prevented from coming into existence by those who would rather pay more for extra service than receive only the same service as others, and by servants who are greedy for gratuities even when already receiving fair wages.

The California commission does not say just what it proposes to do; but it threatens that unless reform steps are taken it will institute an investigation into the rates of the Pullman Company. If it be found "that the rates are generous, and that the company is not poor, but merely mean," the commission suggests, "then the American public would be justified in at least dispensing with the generosity and limiting the company to the barest amount that the cold considerations of justice warrant it in securing."

"The cold considerations of justice" may be good enough for the Pullman Company, but the tipping system has been built up by people who want more than those cold considerations; and the commission has no jurisdiction either over those who willingly pay tips or over the hotels, restaurants and barber shops, which as gladly allow them to be paid as does the Pullman Company. Would the commission consider that the cold considerations of justice require the Pullman Company to polish shoes, brush clothes, keep its patrons posted as to when the train enters a "wet" state and carry hand-baggage—all without extra charge? We suspect that in spite of its remarks about cold justice the commission is hinting that just such personal attentions should be included for the price of merely a berth.

Cheaper upper berths elected one man to Congress. Free shines might land a railroad commissioner in the Senate or a governor's chair. But if there is a discrimination clause in the California law it might cause complications. Some shoes require much more shining than others, and some people require much more service than others.

Most gentlemen's clubs have solved the tipping problem by paying their employees enough to insure good service and rigidly prohibiting gratuities to individuals, replacing them by bonuses or Christmas presents on some systematic basis. This is the ideal system where it can be enforced, but nearly everyone knows of some case where a similar plan has been tried under conditions which made it impossible to enforce the rule, with the result that people who rigidly stood by their rights, and refused to tip were neglected for those who were willing to pay for extra attention. Suppose the Pullman Company tried to make itself popular by setting the good example of announcing that hereafter its employees would be paid an adequate wage, and that they would be discharged if found in the act of accepting a tip. Would this not simply increase the remuneration of the employees without changing the situation as to the patrons?

The California railroad commission in its brief history has done a great deal of reforming of railroads, and gas, electric light, water, telephone and telegraph companies. Possibly it can reform human nature if it is given time enough, and if it can abolish the tipping system it will deserve and receive the heartfelt thanks of the American people. But it will not accomplish much for the public if it confines its attention to this system merely on Pullman cars—however much it may accomplish for the political aspirations of some of its members.

THE COUNTRY WAITING ROOM

SOME very real grounds of complaint, as found in prominent passenger stations, were noted in an editorial in these columns March 20. A letter printed in another column of this issue calls attention to the fact that the deficiencies which were there noted are by no means the only things which need attention, if a railroad company aims to really satisfy its patrons. Unventilated, dirty stations, offensive to all the senses, are common. This subject is not a new one, and to some readers it will be tiresome; but do not the points brought out by our correspondent demand attention? Do they not justify the conclusion that something ought to be done, even though the spectacle of years of failure is constantly before us to discourage effort?

The opinions expressed by the *Evening Post*, the same as our own, have been expressed in these columns many times. In a recent editorial we had occasion to observe that the small-station problem and the true means of settling it had been clearly set forth by Charles Paine, thirty years ago. Evidently, something more than printer's ink is needed to cure this disgrace to our civilization.

The salient point of the *Evening Post's* indictment is in the sentence where it is assumed, in so matter-of-fact a way, that it has been "nobody's business" to abate waiting-room nuisances. The editor seems to take it for granted that only by the action of some state authority can anything be expected to be done. What have railway managers to say to this?

At many small stations the unsatisfactory state of things seems to be nearly or quite incurable. The smallness of the room, the intermittent character of the need of ventilation, the unclean condition of a large proportion of the persons who frequent the station, the difficulty of enforcing the prohibition against smoking, the low pay of the agent and the consequent low standard of neatness held by him—all these make the maintenance of a clean atmosphere very difficult. The question is: Are the newspapers, or the legislatures, going to compel the railroads to frankly avow this to be the situation? For, one reason why the present situation persists is that the issue has never been clearly defined. Railroads point to the good condition of their better stations, and keep silent concerning those which are discreditable.

Many stations are slovenly without the shadow of an excuse; but what the public demands is a clean room at stations where most of the users of the room do not appreciate cleanliness and where the business of the road is so small and unprofitable that the superintendent, unless he is an unusually vigorous hater of dirt, grudges the expense of reasonable janitor service.

"Unsupervised care-takers" is the most expressive phrase in the criticism which we have quoted. That is what is the matter; lack of supervision. Every station has a care-taker; but at many small stations he has so many other duties to perform (being himself the freight, express and passenger agent, cashier and bookkeeper) that he neglects something; and the disagreeable tasks are the ones which are the most neglected. In other cases plain laziness is the trouble. Whatever the trouble, supervision, with authority, by a person who does not have to soil his own hands at the work, is the thing needed.

Within a week the writer has been in a new station on a new road—a station well designed and well built, on a road which has been praised for its tasteful and complete passenger facilities and arrangements—where the atmosphere of the waiting room was nearly or quite as bad as that imagined by the *Evening Post* man, though the number of persons present was not large. This is one of many experiences that seem to warrant the writing of articles such as this.

The maintenance of cleanliness, whether of "toilet" rooms—what a travesty is that word on the filthy places to which it is often applied—wash rooms, offices, waiting rooms or cars, is simple; but it costs a good deal of money. Look at the large sums spent by the best hotels on these features. Ventilation, with electric power everywhere available, is also simple; but also costly. Not a word can be said in defense of the railroad superintendent who does not care for cleanliness; but it is to be admitted that where a station is unprofitable the financial feature of the problem must always bulk large.

Does not this whole subject demand a little more space in the railroads' scheme of educating the public? If a railroad puts up a five hundred thousand dollar station in a city, it is pretty well recognized by the public, at least by well informed citizens, that the expenditure is one which is not warranted by any reasonable calculation of the profits on passenger business; that for such an outlay the railway must draw on its general funds, earned more largely from freight than from passenger traffic; and this simply to satisfy "civic pride." Likewise at the small town, civic pride demands station accommodations which sales of tickets by themselves do not warrant. But neither in this matter nor in others, where the parties involved are not railroad corporations, can ideals of civic pride be carried out except by very considerable expenditures.

NEW BOOKS

The Earning Power of Railroads, 1914 Edition. By Floyd W. Mundy, of Jas. H. Oliphant & Co., 61 Broadway, New York, and The Rookery, Chicago. 514 pages.

The 1914 edition of this annual publication contains some of the principal figures that are ordinarily included in the annual reports of 158 railroads operating about 250,000 miles of line. The book is arranged in the same manner as previously, namely, there are 11 introductory chapters which contain a simple but clear discussion of the essential points that investors should know in making a study of the annual reports of railroads, and following that are the tabular statements for the 258 roads with a short history and description of the financial condition and of the securities of these roads. The chief value of the book lies in its simplicity and in its very convenient form.

Letters to the Editor

PERPETUAL ECONOMY DISCOVERED

ST. LOUIS, MO., April 15, 1914.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

From articles in the *Railway Age Gazette*, it would seem that President Wilson has a golden opportunity for a record in the construction and operation of the Alaska railways.

Mr. Clifford Thorne not only knows all about building a railroad, but admits he can place 3 per cent. bonds at par for the purpose. Appoint him president, and the interest on the $35,000,000 at 3 per cent. will be $1,050,000 annually. Then Mr. Louis Brandeis can save $1,000,000 a day by intelligent operation on the United States railways; say, $4 per mile per day; so on the 1,000 miles in Alaska, he, as general manager, can save $1,460,000 annually, which will pay the interest and leave a nice surplus.

AN OPPONENT OF UNNECESSARY NOISES.

WHAT CAN A PENSIONER DO WITH HIMSELF?

NEW YORK, April 21, 1914.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

A railroad man of over forty years' continuous service, closely approaching the retiring age, and blessed with good health, wonders what he can do to escape the depressing effect of no railroad office to which he can hie after his morning meal; no daily "good morning" from his railroad friends with whom he has exchanged greetings during these many years.

It has occurred to him that some railroad management might put out a pamphlet of "Suggestions to Retired Employees," as to what they might do to lessen the burden; this to include the humbler grades as well as those in apparently easy circumstances. I say *apparently;* there are no really easy circumstances for the man who for long years has been an interested worker and an active watcher, and who finds himself cast aside as he approaches the sunset of life. He cannot as readily make new friends as once he could. He does not wish to be tied down to a regular business which will prevent him from going and coming as he will. And yet his mind should be led away from too much of the reminiscent habit; it is depressing if dwelt upon continuously. Who will in a few lines give a list of suggestions?

A. W. P.

KEEPING PASSENGER STATIONS PRESENTABLE

NEW YORK, March 21, 1914.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The problem of keeping passenger stations up to a first class standard is a very difficult one. The latest ideal in railroading is expressed in the motto, "The public be pleased," and the passenger station is the place where a large share of the pleasing ought to be done; but the average passenger finds that for a considerable part of any given journey, the ideal is so high that it is out of sight—at least the men whom he encounters do not seem to have had a sight of it, except in spots.

At both city and country stations, the passenger encounters numerous annoyances, little and big. In your issue this week you tell of an untidy station in a large town or city; a bulletin board neglected when anxious passengers are waiting for a train while employees are sitting around enjoying themselves; a trainmaster who was uncivil to passengers and another bulletin board on which the information was positively wrong.

In connection with your narrative of these incidents you give an interesting account of a novel and highly commendable enterprise on the part of the St. Louis & San Francisco, where the station agents have been elevated, as it were, by giving them more responsibility—and presumably, where necessary, more pay.

This action of the Frisco affords a fine example of enterprise which it is to be hoped will be widely imitated; but in one important feature, that of clean and sanitary "toilet" rooms, this enterprise seems to be about in the same stage that we find the same feature on many other good roads—the stage of good intentions. If circulars would cure this disgrace, it would have been cured on many roads long ago.

In a recent number of the *Evening Post* (New York) I find the following paragraph, in the department of "Science," edited by a conservative scientific man:

"Everyone who goes about at all in out-of-the-way places—in suburban regions and country districts—must have had the experience of drifting into so-called waiting rooms along railways or trolley lines, calculated to 'turn the stomach' of a well-bred pig—unventilated, dirty, offensive, in fact, to all the senses, an outrage upon decency and a menace to public health. Usually in charge of ignorant and un-supervised care-takers, there is not even a semblance of sanitation. That these places, particularly in cold weather, when waiting passengers crowd into them in large numbers, are fertile sources of disease there is every reason to believe. There is absolutely no excuse for their continued existence in this age of sanitary awakening. They have persisted simply because it has been nobody's business to abate them. It is very much to be hoped that when the New York State Department of Health takes hold of village and town sanitation, this question of wholesome waiting rooms will be one of its first points of attack."

These facts are familiar to every traveler. The criticisms are well deserved. When are we to have relief? The suggestion that the authorities of the state ought to intervene, has, to a railroad man, a sinister sound. The Interstate Commerce Commission, in its regulative inquisitions, has shown a willingness to dip into any detail whatsoever, if only the law could be interpreted as giving the necessary authority. Will it attack water closets next? And the Interstate Commerce Commission is not the only power in Washington. In any department, young men anxious to serve their country with more display, can, if so disposed, get Congress to authorize them to regulate the railroads, under almost any plausible plan. A very little lobbying seems to turn the trick.

The Bureau of Standards, for example, is ready at any time to magnify its own importance. (It is advertising now to test watches; and some day the simple railroad test of watches will be superseded by a five-dollar government test, if the bureaucrats can have their way.) The Marine Hospital service, a branch of the Treasury Department, already supervises water and drinking cups, and has begun to search all cars and stations for things dangerous to health. The State of New York is not far behind the federal government in its hounding of the railroads; and this suggestion of the *Evening Post,* that state authorities should act, is liable to be carried out by the lawmakers at Albany any day—especially if Tammany Hall, with its influence there, should see a chance for graft in the appointment of a few dozen inspectors.

The majority of small stations produce no direct profits. The expense of running them is justified only by looking at the question in its broadest aspect. The road runs through a town; it wants the friendship of the citizens as an element in its general prosperity as a carrier; and so it must itself be friendly. And this friendliness implies a fair standard of decency in station buildings; a fair standard of efficiency in the attitude and conduct of the agents and in the employment of sufficient competent help. And a railroad must maintain higher standards of neatness, hygiene, politeness and morals generally than the average of its customers maintain. It must keep up with the better class of citizens. A station, like a city hall, should set standards decidedly above the ordinary. And the only chance of recouping the expense of station maintenance is to show to the aforesaid better class of citizens that they have a duty to see that their servants, the lawmakers, do not prevent railroads from earning a decent income.

The moral of all this is quite plain: If the railroads wish the state to keep hands off they must clean house themselves. Is there any other lesson?

T. M. H.

Economical Locomotive Performance on the Frisco

Almost a Million Dollars Has Been Saved in the Fuel Bill During the Past Three Years by Careful Supervision

Everything connected with the operation of a railroad has some effect, direct or indirect, on the amount of fuel used. Both the operating and the mechanical departments are responsible for the best use of the fuel—the operating department because it is in a position to prevent abuses to the locomotive while it is on the road; the mechanical department because its function is to keep the locomotive in the best possible condition while it is in its charge.

Because of a keen realization of these things, the fuel service department of the St. Louis & San Francisco, which was organized in December, 1910, has developed along peculiar lines as compared to similar departments on other roads. It is not the intention in this article to go into the details of the development of this work or to thoroughly cover all of the methods which are used, as this was done to splendid advantage in a paper on "Locomotive Fuel Economy," which was presented at the May, 1913, meeting of the St. Louis Railroad Club by Robert Collett, at that time superintendent of locomotive fuel service on the Frisco. An extensive abstract of this paper was published in the *Railway Age Gazette* of November 7, 1913, page 874. The purpose of this article is rather to set forth more clearly the fundamental principles underlying this work, which in a large measure have been responsible for its success, and also to cover certain important developments which have taken place within the past year.

Roughly, therefore, the department in charge of fuel economy was started in December, 1910, when Mr. Collett first began to investigate conditions on one of the divisions and to take measures to improve the fuel record on that part of the road. As the work was gradually extended to the other divisions, assistants were appointed until there is now one general assistant, and one representative on each of the operating divisions, or 12 in all. Most of these assistants are traveling engineers who were transferred to the fuel service department. Because both the operating department and the mechanical department are responsible for the best use of the fuel, the head of the fuel service department reports to neither one of these departments, but direct to the general manager. This is on the theory that no department should keep its own score, but that it should be in the hands of a disinterested party who will not be liable to be prejudiced in any way.

The title of the superintendent of locomotive fuel service has recently been changed to that of superintendent of locomotive performance; at the same time the scope of the work of the department was broadened and its responsibilities have been considerably increased. The assistant superintendents of locomotive performance rank equally with the assistant superintendents on the division and have an equal opportunity for promotion to the position of division superintendent. As officers of the company they are authorized to give instructions to any employee on the division.

When the campaign was started last fall to increase the train and car loading, as was described in the *Railway Age Gazette* of March 13, 1914, it soon became evident that it would result in additional fuel economy on the basis of the amount used per ton mile. Inasmuch, also, as the assistant superintendents of locomotive performance clearly understood the capabilities of the different types of locomotives, they were given the additional responsibility of checking up train loads in connection with their regular duties, and, if they found it advisable, were empowered to order more cars placed in the train in order to more closely approximate the rating of the locomotive.

The department of locomotive performance is also responsible for the proper distribution of the power over the system. Since its representatives are in close touch with the needs of the transportation department and understand thoroughly the facilities which are at the command of the mechanical department for repairing and handling the power, they are in a splendid position to direct the distribution of the power to meet the requirements of the system as a whole. As far as possible, depending, of course, on conditions, the attempt has been made to limit the number of classes of locomotives on any one division to the lowest possible number, thus simplifying the care of them both as to material requirements and familiarity with their characteristics on the part of the men who operate and care for them.

The splendid work which has been done by the department is indicated by the following data showing the fuel performance on the basis of pounds used per car mile in passenger service and per 1,000 ton miles in freight service for six months periods since the establishment of the department:

	Lb. coal per passenger car mile	Lb. coal per gross ton mile
January, 1910	23.34	374
July, 1910	20.60	301
January, 1911	25.56	358
July, 1911	19.20	256
January, 1912	25.78	350
July, 1912	18.74	259
January, 1913	21.14	301
July, 1913	17.62	237

The relatively high consumption in the six months period beginning January, 1912, was due to the very severe weather conditions.

The purpose of this article must not be misunderstood. It is not the intention to claim that the Frisco has the most finished or the best methods for securing fuel economy. Those in charge realize only too well that there is still much to be done; that in certain respects the methods used fall far short of what they should. Proposed plans, or plans which are not far enough advanced to show practical results, will not be touched on. Conversely, some things are being done exceptionally well, and these will be considered, and it is believed, in most cases at least, the reasons for their success will be apparent. A shrewd observer, if he visits the road, will undoubtedly find other things which could be handled better than they are. In all fairness, however, it must be remembered that the work is still considered to be in a state of development, and that improvements are being made in such rapid succession that even when this article goes to press progress will have been made which will make it incomplete.

To meet possible criticism it must be said that while the department of locomotive performance has cut down the cost of fuel per ton mile, and that the operation of the locomotives has been greatly improved, the record as to engine failures is disappointing and that improvement in this respect, which will surely be brought about in the near future, will do much to secure even greater fuel economy and more efficient operation of the road as a whole.

INDIVIDUAL PERFORMANCE RECORDS

The function of the department of locomotive performance is to see that the best use of the fuel is made from the time it is taken from the tender until it is consumed. The work of the department is conducted on the belief that the men are anxious to do their best and that lack of interest and poor work is more often due to the absence of intelligent supervision or because the men do not know how to do their work properly. Logically, therefore, the work which is being carried on is largely of an educational nature. A man is not taken to task because he does a thing wrong. Rather he is shown how to do it right; his interest is awakened and he is made to feel that the instructor is his friend. If later it becomes necessary to talk to him pretty plainly in order to awaken him to his responsibilities, it can be done in such a way as not to have him feel hurt and become an-

tagonistic, but rather to make him feel ashamed of his lack of intelligent interest and thus spur him on to do better work.

The basis of the effort which has been made in the direction of greater fuel economy is, therefore, the fact that the human element is by far the most important factor. A representative of the fuel department may ride on a locomotive and notice things which are not done properly. He may direct attention to these and painstakingly instruct the men as to the proper way of performing the work. Some men will take full advantage of this instruction. Those who do not improve their practices at once, drop in line later as they realize that they will not average up with the men who are improving their methods, and that the company is in a position to keep a check on their performance. The complimentary letters occasionally written by the superintendent of the division and the superintendent of locomotive performance for exceptionally good work performed by the crew, are also appreciated by the men and are a further incentive to do better work. If, in addition to these instructions, an accurate record is made of the performance of the engineer and fireman, while the assistant superintendent of locomotive performance is on the engine; and the men realize that this record is being made and is to be placed on file for reference in the office of the division superintendent and in the office of the superintendent of locomotive performance; and in addition the men realize that if the report is good, and three such reports are rendered in succession, they will receive a letter of commendation, then their interest will surely be awakened and they will take a far more intelligent interest in their work. If, on the other hand, the record is poor and does not show improvement as the assistant superintendent of locomotive performance rides the engine from time to time, and if the engineer and fireman realize that their records, which are not of the best, will be referred to, if for any reason they are otherwise found at fault and an investigation is made; and further if they know that these records will be consulted in case of possible opportunity for promotion, then the average man at least will be spurred to put forth his very best efforts.

It was for these reasons that the forms which are illustrated were developed, so that the assistant superintendents of locomotive performance could conveniently record the most important data to be observed in making trips with the different crews. Reproductions of some of these forms giving typical cases of improvement which have been caused by their use are shown in the illustrations. The first seven lines give data as to the train and engine crew, the size of the train and the amount of fuel used. The items in the column at the left under "Handling of" refer to the work of the engineer, and those items at the right to that of the fireman. This part of the report is most important and if properly filled out should give a good idea of the capabilities of these men for performing their work. If they are weak in any respect they are given the necessary advice and instruction and are expected to show an improvement when the assistant superintendent of locomotive performance next finds an opportunity to ride with them. More extended comment as to the performance of the men or the condition of the engine may be made under "Remarks" at the bottom of the card. The items under "Condition of Engine" need no explanation.

It would be difficult to overestimate the value of these forms, and in order that their use may be better understood typical cards have been selected from the records of two of the engineers. One of these men, Williams, was a new engineer when the first report was made on June 18. Except for co-operation, his record was only fair. Within a comparatively short period the assistant superintendent of locomotive performance made several trips with him and two typical cards have been selected from the reports covering the next two months. The report of one of these trips made on July 2 indicates a considerable improvement, but the lubrication and handling of the injector still remain fair. The items under "Remarks" show that he was given further definite instructions as to these things. The report for August 29 shows that still further improvement had been made. It will be noted that there was a different fireman on each trip. The superintendent of locomotive performance and the division superintendent have duplicate records for each trip, so that two files may be assembled in each office, one for the individual engineers and the other for the individual firemen. In like manner, therefore, the cards for any one fireman may be examined and the progress or lack of progress noted. The fireman is largely responsible for handling the injector, but if he does it improperly and the engineer does not see that the bad practice is rectified, then the engineer is marked "Fair" also, for the operation of the engine is in his charge and he is responsible for it. In the same way, but possibly to a lesser degree, an excessive opening of the pops would indicate a lack of co-operation

Form 722 Local

Date 6/18 1913 Eng. No. 1340 Tr. No. 1/34
Engineer Williams Fireman Kerruish
From Bourbon To Tower Grove
Cars in Train 42 Tons in Train 1389
Pass. Car Miles ____ Gross Ton Miles ____
Scoops Coal ____ Lbs. Pr. Pass. Car Mile ____
Tons of Coal ____ " " 1,000 Ton " ____

HANDLING OF

Reverse Lever	Fair	Cond. of Fire	Light
Throttle	Fair	Average No. Scoops per Fire	8
Brake Valve	Fair	Times Grate Shaken	1
Lubrication	Fair	Times Pops Opened	0
Injector	Fair	Injector	Fair
Co-operation	Good	Attention to Duties	Fair
Inspection	Fair	Use of Blower	

CONDITION OF ENGINE

Steaming Qualities	Good
Flues and Fire Box	Good
Valves and Valve Gear	Good
Cylinder Packing	Good
Rods and Boxes	Pounding very bad
I. C. C. Defects	Throttle leaking bad
Quality of Coal	Fair

Remarks: Main wedges should be set up, all knuckle joint bushings should be removed, throttle leaks very bad, should be ground in and spring should be fixed in throttle lever.

W.J. Kelsey Asst. Supt. Loco. Fuel Service

Make out one for each engine ridden and send one copy to Division Superintendent and two to Superintendent Locomotive Fuel Service.

Form 722 Local

Date 7/2 1913 Eng. No. 1341 Tr. No. 37
Engineer Williams Fireman McKean
From Sullivan To St. James
Cars in Train 34 Tons in Train 1045
Pass. Car Miles ____ Gross Ton Miles ____
Scoops Coal ____ Lbs. Pr. Pass. Car Mile ____
Tons of Coal ____ " " 1,000 Ton " ____

HANDLING OF

Reverse Lever	Good	Cond. of Fire	Light
Throttle	Good	Average No. Scoops per Fire	6
Brake Valve	Good	Times Grate Shaken	0
Lubrication	Fair	Times Pops Opened	3
Injector	Fair	Injector	Fair
Co-operation	Good	Attention to Duties	Good
Inspection	Fair	Use of Blower	

CONDITION OF ENGINE

Steaming Qualities	Good
Flues and Fire Box	Good
Valves and Valve Gear	Good
Cylinder Packing	Good
Rods and Boxes	Fair
I. C. C. Defects	None
Quality of Coal	Good

Remarks: Instructed engineer in lubrication and inspection, called his attention to fireman pumping engine too hard.

W.J. Kelsey Asst. Supt. Loco. Fuel Service

Make out one for each engine ridden and send one copy to Division Superintendent and two to Superintendent Locomotive Fuel Service.

Form 722 Local

Date 8/29 1913 Eng. No. 1345 Tr. No. X
Engineer Williams Fireman Jahrous
From Sullivan To Bourbon
Cars in Train 4 Tons in Train ____
Pass. Car Miles ____ Gross Ton Miles ____
Scoops Coal ____ Lbs. Pr. Pass. Car Mile ____
Tons of Coal ____ " " 1,000 Ton " ____

HANDLING OF

Reverse Lever	Good	Cond. of Fire	Light
Throttle	Good	Average No. Scoops per Fire	5
Brake Valve	Good	Times Grate Shaken	0
Lubrication	Good	Times Pops Opened	0
Injector	Good	Injector	G by Engr
Co-operation	Good	Attention to Duties	Good
Inspection	Fair	Use of Blower	

CONDITION OF ENGINE

Steaming Qualities	Good
Flues and Fire Box	Good
Valves and Valve Gear	Good
Cylinder Packing	Good
Rods and Boxes	Fair - Pounding in rods
I. C. C. Defects	0
Quality of Coal	Fair

Remarks: Water glass cocks opened 2 times, gauge cocks tried 3 times. Called Engrs. attention to inspection. Had Engineer key up back end main rods. This eng. on work train. At Sullivan.

W.J. Kelsey Asst. Supt. Loco. Fuel Service

Make out one for each engine ridden and send one copy to Division Superintendent and two to Superintendent Locomotive Fuel Service.

Individual Performance Records Showing the Progress Made by a New Engineer

on the part of the engineer and fireman. If the engine should unexpectedly have to stop or run slow, the fireman, if his fire is too hot, should prevent popping by increasing the rate of feeding water to the boiler, if conditions will permit.

The second set of performance cards are selected from a set of six or eight cards giving the record of an old engineer. This man had decided ideas of his own about operating a locomotive and did not give it the study and attention which he should. This was indicated by the record of the trip made with him on June 29. His work was fair except for the handling of the throttle, and the comments under the head of "Remarks" speak for themselves. Another trip made with him on July 8 showed some improvement, and after a number of trips the record was made on August 8 which, with the note under "Remarks," indicated a very decided improvement.

"Condition of Engine" is a most important factor in fuel economy. If the condition is bad the fuel record will suffer in spite of the most skillful handling. If it is in poor condition and defects are not promptly remedied, the engineer and fireman will be discouraged in their efforts to make a good showing and will lose interest in trying to do so. It is for this reason that the "Condition of Engine" is given such prominence on the performance cards.

Of course these records would mean very little if not properly used, and it is therefore of interest to know exactly how they are followed up. If an engineer has all the items on his card marked "Good" for three successive trips, which a representative of the locomotive performance department may make with him, the fact is drawn to the attention of the superintendent of locomotive performance, who writes his assistant a letter—not a form letter, but individual in each case—somewhat similar to the following:

I have before me reports of trips you have ridden with Engineer M. J. Murphy, July 1, 8, August 1 and 6, and on all of these reports the engine management was first class.

It is not always the case that our locomotives are in 100 per cent. condition. There is nothing that will assist in bringing about a condition of this kind more quickly than first class management and inspection by the crew. I know, from personal observation, as well as your reports, that Mr. Murphy endeavors to give us this help, and furthermore feel that as far as Mr. Murphy is concerned he is doing everything in his power to establish a good fuel performance.

There are a great many items that affect the fuel performance over which the engineers have no control, but it is a pleasure to call to the attention of our general officers the good work of our enginemen so that the information can be shown on the personal record of the crew.

I am handing you an extra copy of this letter. If you care to do so, you may hand it to Mr. Murphy with request that he endeavor to educate the men who fire for him to become as good engineers as he has proven himself to be.

A copy of this letter is also sent to the division superintendent. Naturally the engineer who receives a copy of such letter from the assistant superintendent of locomotive performance is proud of it and shows it to his fellows. Not only is he inspired to do better work, but his companions, not wanting to be behind, try to improve their work in order that they may be similarly rewarded. That the men appreciate these letters is indicated by the following letter from one of them, which is selected from a large number in the files of the superintendent of locomotive performance:

I beg to thank you for the letter I received from your office a few days ago in regards to complimenting me on my performance in the way of handling an engine and saving of fuel. I have always tried to give the company good service and will continue to do so in the future. Hoping that I will not cause you to regret the compliment I received from your office, I am, yours truly,

H. C. DEAN, Engineer.

It may be said in passing that similar acknowledgments are made in the great majority of cases.

Of equal interest is the fact that men who do not receive such letters, although the assistant superintendent of locomotive performance may have made several trips with them, in some cases write in and want to know why they have not received a letter of commendation. It is true that if their memories served them well they would probably recall suggestions which had been made to them by the representative of the department of locomotive performance on one or more of the trips. A request of this kind gives the representative of the fuel performance department a splendid opportunity to give some very sound advice and usually with telling effect. The use of these individual performance records marks one of the most important develop-

Form 722 Local

Date 6/29 1913 Eng. No. 1046 Tr. No. 4
Engineer L. W. Fireman Guenzler
From Newburg To Rolla
Cars in Train 8 Tons in Train
Pass. Car Miles Gross Ton Miles
Scoops Coal Lbs. Pr. Pass. Car Mile
Tons of Coal " " 1,000 Ton "

HANDLING OF

Reverse Lever Fair Cond. of Fire Good
Throttle Good Average No. Scoops per Fire 5
Brake Valve Fair Times Grate Shaken 1
Lubrication Fair Times Pops Opened 5
Injector Fair Injector Fair
Co-operation Fair Attention to Duties Fair
Inspection Use of Blower

CONDITION OF ENGINE

Steaming Qualities Good
Flues and Fire Box Fair
Valves and Valve Gear Good
Cylinder Packing Good
Rods and Boxes Pounding some
I. C. C. Defects None
Quality of Coal Good
Remarks Engineer has a good disposition but don't manage his engine good, and don't seem to make a study of his work. Hooks lever up too much at one time (over)*

R. Collett Asst. Supt. Loco. Fuel Service

Make out one for each engine ridden and send one copy to Division Superintendent and two to Superintendent Locomotive Fuel Service.

Form 722 Local

Date 7/8 1913 Eng. No. 1053 Tr. No. 4
Engineer L. W. Fireman Guenzler
From Newburg To St. Louis
Cars in Train 8 Tons in Train
Pass. Car Miles Gross Ton Miles
Scoops Coal Lbs. Pr. Pass. Car Mile
Tons of Coal " " 1,000 Ton "

HANDLING OF

Reverse Lever Fair Cond. of Fire Light
Throttle Good Average No. Scoops per Fire 6
Brake Valve Fair Times Grate Shaken 2
Lubrication Good Times Pops Opened 3
Injector Fair Injector Fair
Co-operation Good Attention to Duties Good
Inspection Good Use of Blower

CONDITION OF ENGINE

Steaming Qualities Good
Flues and Fire Box Weak
Valves and Valve Gear
Cylinder Packing Good
Rods and Boxes Fair
I. C. C. Defects
Quality of Coal Good
Remarks

W. J. Kelsey Asst. Supt. Loco. Fuel Service

Make out one for each engine ridden and send one copy to Division Superintendent and two to Superintendent Locomotive Fuel Service.

Form 722 Local

Date 8/8 1913 Eng. No. 1050 Tr. No. 3
Engineer L. W. Fireman
From St. Louis To Sullivan
Cars in Train 9 Tons in Train
Pass. Car Miles Gross Ton Miles
Scoops Coal 372 Lbs. Pr. Pass. Car Mile
Tons of Coal " " 1,000 Ton "

HANDLING OF

Reverse Lever Good Cond. of Fire 1st class
Throttle Good Average No. Scoops per Fire 4 & 5
Brake Valve Good Times Grate Shaken 0
Lubrication Good Times Pops Opened 0
Injector Injector Good
Co-operation Good Attention to Duties Good
Inspection Use of Blower

CONDITION OF ENGINE

Steaming Qualities Good
Flues and Fire Box Good
Valves and Valve Gear Good
Cylinder Packing L. B. End M. Rod & Lt Wedge
Rods and Boxes pounding
I. C. C. Defects
Quality of Coal Good
Remarks Engineer doing good work and taking lots of interest. Fireman first-class also.

R. Collett Asst. Supt. Loco. Fuel Service

Make out one for each engine ridden and send one copy to Division Superintendent and two to Superintendent Locomotive Fuel Service.

*Don't watch water or lubricator closely or inspect his engine carefully. Does not handle train or engine smoothly in any particular. Kelsey should ride with him several trips.

Individual Performance Records Showing the Progress Made by an Old Engineer

ments that have been made along the lines of fuel economy on the railroads of this country.

EFFICIENCY TESTS

Frequently when an assistant superintendent of locomotive performance is riding an engine over the division an exceptionally good record will be made. In such cases a special report is sent to the superintendent of locomotive performance, and either he or the division superintendent makes it a practice to send a congratulatory letter to the men who had charge of the locomotive. A typical letter of this sort and its acknowledgment are reproduced herewith:

SPRINGFIELD, MO., August 20, 1913.

To MR. P. ELDER, Engineer, and
MR. WM. GUENZLER, Fireman,
Tower Grove, Mo.

Gentlemen:—I am advised that you recently handled 29 cars, 1,005 tons, from Newburg to Tower Grove, with Engine 1338, with 900 scoops of coal, or six tons, 115 pounds per ton mile, and the report of this trip shows every item of handling of the trip was good.

I am very glad to note reports of this kind, and wish to compliment you on such service. Yours truly,

J. F. SIMMS, Superintendent.

ST. LOUIS, MO., September 3, 1913.

MR. J. F. SIMMS, Superintendent,
Springfield, Mo.

Dear Sir:—In reply to your letter commending our services in the economical handling of fuel and engine.

We wish to thank you, it being an incentive and encouragement for continued good work and for which we will endeavor to see that you shall have no cause to regret. We remain, very respectfully,

P. ELDER, Engineer, and WM. GUENZLER, Fireman.

These performances are usually bulletined on the district where the record was made and sometimes, if they are especially noteworthy, mention is made of them in the *Frisco Man*, the railroad magazine, which is furnished to all the employees. This naturally stimulates interest on the part of others in improving their practices so that they may equal or better the performance.

ASSIGNED ENGINES

Until recently engines on the Frisco were in pool service. An attempt is being made to secure the benefits of assigned engines by lengthening out the passenger runs and having, as far as possible, two crews handle each locomotive, one relieving the other, but each crew always using the same engine. This released a number of freight engines which were being used in passenger service and has made it possible, together with other changes, to take very nearly all of the engines out of pool service. The records where the engines had been regularly assigned indicate a most gratifying improvement as to engine performance and particularly as to engine failures.

The following is a typical instance of the way in which the passenger runs have been lengthened. In making the trip from St. Louis, Mo., to Springfield (239 miles) it was formerly the practice to change engines at Newburg, 119 miles from St. Louis. Now the engines make the run of 239 miles, but the crews change at Newburg. It is true that the locomotives run into Springfield and St. Louis with dirtier fires than before, but the loss in fuel from this cause does not amount to more than if engines with new fires had replaced them at Newburg. The advantages are a much greater mileage from the passenger locomotives per month; the engine house at Newburg is relieved of work on passenger engines, thus allowing more time for attention to freight locomotives, where it can be used to splendid advantage; more time is also allowed for making repairs to passenger power at the terminals and much of it can be done in the day time, at least at one end of the run. In addition, the item of overtime for making repairs is very considerably reduced. Of course the locomotives must be kept in better condition to stand the longer run, especially in the case of the older classes of power, but more time is available in which to give them this attention. It costs much less to turn and handle one engine at the end of a long run than for two engines for the short runs.

The practice is being extended wherever conditions will admit. The engine house foremen and despatchers usually object to the plan when it is first proposed, and the change is never made on a division until the superintendent has given his approval and then a personal explanation must be made to him for any deviation from the practice.

As suggested above, this change in the handling of passenger power has made it possible to utilize several freight engines which had been used for that purpose, so that today, less than six months after the movement to assign engines was first inaugurated, the greater number of all locomotives on the system have been taken out of pool service. Another factor which helped the situation was that as the tonnage of the trains was increased, when the campaign toward that end started last fall, the number of trains was reduced, making more power available and allowing the large locomotives to be placed where they could be used to the best advantage. It has also been found that the regularly assigned engines make better time than the pooled ones because of being maintained in better condition.

That the men appreciate the assigned power is indicated by the following incident, which is typical of several similar experiences: The first man up at one of the terminals was assigned to a high speed stock train. He asked when the next train would go out and was informed that it would leave in four hours and would be a slow speed drag. He advised the despatcher that his engine was not in sufficiently good condition to handle the high speed train and be sure of making the schedule, and at his own request he was set back to haul the drag train.

PERFORMANCE SHEETS

The important feature of such performance sheets as have thus far been used on the Frisco is that the record is kept according to engines and not as to enginemen. If an engine in a given class of service shows up badly on the performance sheet its condition is immediately investigated. If it is found to be in good condition then the work of the men who operated it is investigated. If the engines are in pool service, the poor trips may be investigated and the responsibility located, whether it concerns special conditions under which the engine operated or poor work on the part of the engine crew.

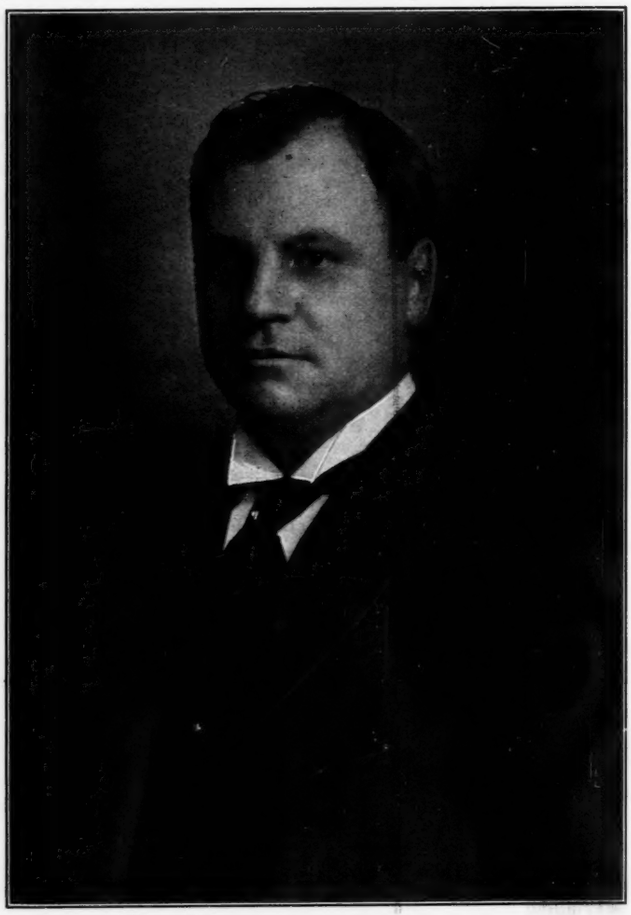
The chief reason why individual records have not been kept for the engineer and fireman is that this is quite liable to result in shrewd practices, particularly where the weighing facilities are not accurate. The individual performance records previously referred to locate the poor men in a much more accurate way. As a fundamental principle, the training of enginemen to secure proper performance must be done through personal contact and intelligent supervision and cannot be accomplished by means of a performance sheet, although it will often help to locate weak spots and is useful if the results of a trip are available shortly after it is made.

NEW RAILWAY LINE IN RUSSIA COMPLETED.—On February 14 the railway line from Odessa to Bakhmatch was opened for travel. This line shortens the distance from Odessa to Moscow by about 130 miles and also opens up new country between Odessa and Bakhmatch.

A RECORD RUN IN IRELAND.—On February 26, the Great Northern Railway of Ireland ran a special non-stop train from Belfast to Dublin for the chairman of the White Star Line. The distance of 112½ miles was covered in 116 minutes, or at an average speed of 58.19 miles per hour, which constitutes a new record speed for this railway if not for Ireland. The train consisted of a parlor car and a third class coach, and was drawn by one of the latest superheater eight-wheel express passenger engines. The record is all the more remarkable, because speed had to be reduced to 12 miles an hour at five different places because of maintenance of way work, to 20 miles an hour approaching Scarva and Drogheda, and to 30 miles an hour near Poyntzpass. The train also had to meet a grade of slightly over 1 per cent. extending 8½ miles.

WILLIAM G. BESLER

William G. Besler, vice-president and general manager, has been elected president of the Central of New Jersey, succeeding George F. Baer, who died last week. Mr. Besler has been in immediate charge of the operation of the Central of New Jersey since 1902. He came to the property at a time when there was almost continual friction between the employees and the management, and his first difficult problem was to straighten out this situation. Being naturally democratic, his personality won him almost immediate success in this respect. He is a man whose tact has the appearance of and probably very largely actually consists of blunt, common sense honesty. He is a man with little respect for binding traditions or theories. In many ways his methods are those of what is often called the old school general manager. They have shown remarkably successful results on the Central of New Jersey.



William G. Besler

In 1901, the year before Mr. Besler came to the road, the total mileage operated was 639 miles, of which 224 miles had second track and about 30 miles third and fourth track. On June 30, 1913, the company operated 676 miles, of which 262 had second track and about 30 third and fourth track. Total operating revenues in 1901 amounted to $15,287,000, and in 1913 to $28,406,000. This gain in gross revenue of not much less than 100 per cent. has therefore been accomplished with an increase in first track mileage of only about 6 per cent., and not much greater corresponding increase in second track mileage. One very remarkable thing about this great development in 12 years on the Central of New Jersey is that the great increase in freight and passenger density, with its corresponding increase in earnings, has been brought about not by a spectacular increase in train loading, but in very good part by an increase in train mileage; but, nevertheless, the economies per train mile have been great enough so that the ratio of transportation expenses to total operating revenues in 1901 was 27.49, and in 1913 29.92. The average train load of revenue freight in 1901 was 471; in 1913 547. The number of passengers per train mile in 1901 was 53.48, and in 1913 80.80. The total number of revenue ton miles handled increased from 1,395,000,000 in 1901 to 2,482,000,000 in 1913. The passenger train mileage increased from 3,281,00 in 1901 to 4,586,000 in 1913. As was mentioned in the comments in these columns last week on George F. Baer, the actual management of the Central of New Jersey was left by Mr. Baer entirely in the hands of his vice-president and general manager.

William G. Besler was born March 30, 1864, at Galesburg, Ill. He graduated from the Massachusetts Institute of Technology in 1888, but had begun railroad work in 1880 as trainmaster's clerk on the Chicago, Burlington & Quincy, working during the four years from 1880 to 1884 as clerk, trainmaster and chief train despatcher. After graduating from the Institute of Technology he got a position as trainmaster on the Burlington, and within the year had been made superintendent. In 1899 he went to the Philadelphia & Reading as superintendent, and the following year, 1900, was made general superintendent. In 1902 he went to the Central of New Jersey as general manager, and the following year was made vice-president and general manager in entire charge of operation.

U. S. GOVERNMENT RAILROADS

The Panama Railroad with its monopolistic freight tariff, and the proposed lines in Alaska, with their big problems of public policy, do not by any means complete the list of our governmental railroad enterprises. Uncle Sam has a road 19 miles long in Idaho and he is now building one of about the same length in Arizona. The route of the last named extends about 20 miles south from Yuma, and the road is to be a part of the construction plant for a levee along the Colorado river to protect from inundation lands to be irrigated under the provisions of the Reclamation Act. But, as the people in that vicinity have no better means of transportation, the Interior Department proposes to operate the road for the carriage of passengers and freight. The government probably will be in the market for cars and engines, but judging by the Idaho enterprise, its wants in this direction will not be extensive. It is expected that the track will be ready for use within a month or two.

The Idaho road is known as the Boise & Arrowrock. It is a full fledged, standard gage railroad, running from the terminus of a branch of the Oregon Short Line to the site of the Arrowrock dam—the big dam now under construction on Boise river, about 20 miles above Boise, Idaho. The main line is 17 miles in length with maximum grades of 1½ per cent., while the 2 miles of spur tracks have maximum grades of 3 per cent. There are three wooden truss bridges along the main line.

Grading for the road was done by contract and was completed in October, 1911, involving the excavation of nearly a quarter of a million cubic yards of material. All of the remaining construction work, including culvert and bridge building, track laying, ballasting, etc., was done by government forces, working an 8-hour day. The total cost of construction was about $20,000 per mile.

The rolling stock consists of 2 locomotives, 2 passenger cars, 4 flat cars, 3 box cars, and miscellaneous equipment of hand cars, speeders, etc. One train is run from Arrowrock to Barberton and return each week day, with two trips on Saturday.

The total number of ton-miles of freight carried to date is nearly a million. The cost per train-mile of operating the road to the end of December, 1913 (30,337 train-miles), was $2.34. About 45,000 passengers have been carried to date, many of them sightseers.

Mr. Brandeis' Brief and Railroad Rebuttal in Rate Case

Acknowledging Need of Greater Revenue Mr. Brandeis Opposes the Rate Advance. Mr. Willard's Answer

On Thursday and Friday Louis Brandeis, special counsel for the Interstate Commerce Commission, made an oral argument based on the brief which he submitted, and George S. Patterson and Daniel Willard made short oral statements in rebuttal.

The following is a very much condensed abstract of Mr. Brandeis' brief, the language of the brief being preserved insofar as practicable, consistent with the space which can be given to it.

The railroads have assigned six separate causes for their lessened net earnings: (1) Reduced rates, (2) increased rate of wages, (3) added expenses due to federal and state laws, (4) increased cost of certain supplies, (5) increased taxes, and (6) increased cost of money. It is clear that the causes alleged by the carriers do not account fully for the increasing operating ratio. If the 1903 average rates had applied in official classification territory on the 49 railroad systems in 1913, the aggregate revenues would have been $67,252,989 greater than they actually were. However, other public service corporations whose business has been very prosperous made during the same period far greater reductions in price to the consumer. This has been true with gas companies, electric light companies, telephone companies and street railway service.

It would appear that the average increase in the rate for wages for 1914 over 1910 must be as much as 9 per cent. Wages constitute a very large part of operating expenses and absorb a large percentage of operating revenues. It is therefore evident that an increase of 8 or 9 per cent. in wages would have a very marked effect on net operating revenues.

The railroads have been asked to state the amount of so-called unproductive expenditures from July 1, 1907, to June 30, 1913, charged to operating expenses. Only a small number have as yet answered this question, but the answers made indicate a substantial increase from year to year.

It is true that the prices of coal and ties have increased somewhat in recent years, but manufactured supplies have decreased. It is true that railroad taxes have increased largely in recent years, but the increase of taxes has been general in all businesses and the ratio of railroad taxes to gross revenues is still small as compared with the taxes paid by some very prosperous public service corporations. For instance, the Baltimore & Ohio taxes were 3.03 per cent. of total operating revenue in 1913 and the New York Central 4.12, while 69 Massachusetts gas companies averaged 8.9 per cent. in 1912 and 55 Massachusetts electric light companies nearly 10 per cent. Railroads have in common with other businesses been necessarily affected by the increase in rates of interest generally prevailing in recent years, but it must be remembered that interest rates fall as well as rise and we appear to have entered a period of declining rates. Furthermore, two grave and common mistakes in railroad financing have contributed largely to higher interest rates—resorting to short term notes in part for purposes not legitimate, and straining credit by undue expansion. This policy resulted in disaster to the New Haven, the Boston & Maine, the St. Louis & San Francisco, the Rock Island and the Pere Marquette, but the strain has affected many others where the unwisdom of the policy of using credit to the utmost is not so apparent. The Baltimore & Ohio's credit must be now affected by the strain incident to its potential acquisition of the Cincinnati, Hamilton & Dayton after its alliance to the Pere Marquette was broken by receivership and the Erie rejected its advances. Furthermore, the Baltimore & Ohio could at any time have reduced its own borrowing and interest charges by selling its Reading stock, which at market values would have yielded about $35,000,000. The policy of expansion has increased the cost of new money even to so strong a company as the Pennsylvania. Over supply decreases values. There is such a thing as an over supply even of Pennsylvania securities, and when the market is over supplied the cost to the Pennsylvania of raising new money necessarily rises.

The increase in the several elements of cost of operation does not account fully for the inability of the companies to earn adequate profits at existing rates. It is mainly in food products and the cost of retail distribution that the recent increase in the cost of living is due. In the field of manufacturing new inventions and better organizations and methods have overcome practically all added costs due to increased rates of wages or taxes and largely even increased costs of raw material. Railroad wage scales have not increased more than those in other businesses. Both public service corporations and private industrial concerns have had to bear equally with railroads the increase in taxes and the increased cost of fuel. The added operating expense due to federal and state regulation has doubtless been greater in railroads than in the public service corporations; but the gain to the railroads during this period resulting from the abolition of rebates has far more than offset the additional expenditure attendant upon railroad regulation. Relatively the increased cost to railroads of new capital has been greater than to public service and industrial corporations; but it must be remembered that the per cent. of direct wages to all costs of production and distribution and the amount of capital to gross earnings are exceptionally large in railroading.

During recent years the public service corporations and leading manufacturing interests have doubtless made far greater advances in efficiency and economy than the railroads, but in one department transportation efficiency has made great strides. Through the introduction of powerful locomotives and large cars and the elimination of heavy grades and curves the average load per loaded car increased from 19 tons in 1903 to 22.8 tons in 1912, or 19.6 per cent., and the average freight train load from 391 in 1903 to 509.8 in 1912, or 30.4 per cent.

The average load of coal, coke and ore cars has doubled in recent years. The effect has been to greatly reduce the relative tare or dead weight. The increased operating ratio of the railroads (exclusive of taxes) appears to be due in part to the fact that in respect to other services performed by the railroads no similar increase of productiveness was attained, and in part to the fact that new additional services were performed by the carriers without additional compensation.

A most surprising difference exists in respect to cost accounting between railroading and manufacturing. Leading American manufacturers know accurately today the cost of every one of the numerous articles made and sold by them. Railroads which make and sell a most varied transportation service do not know the cost of any of the services which they furnish. Railroads generally fail to keep accounts, so that even the total cost of operation from year to year may be accurately compared because of the ever varying standard of equipment, depreciation and repairs and of maintenance of way charges. Although labor constitutes so large an item in the total operating expenses and increased wages is presented as the main cause of the railways' "plight," few, if any, railroads have kept any account which shows accurately the labor cost of operating as distinguished from the total labor expended both in operating the railroad and in making improvements. Maintenance accounts, instead of reflecting changes in the actual cost of operation from year to year, reflect rather the financial prosperity or adversity of the company. Carriers' legitimate revenues cannot be conserved unless the rate maker has a reason-

ably accurate knowledge whether a particular service is rendered at a profit or at a loss. No adequate explanation can be found for the multitudinous instances of unremunerative rates and practices prevailing on our railroads except lack of knowledge on the part of managers of the disastrous financial results of these rates and practices.

More potent as a cause of unsatisfactory net income than those enumerated by the carriers is their failure to conserve revenues.

PASSENGER SERVICE

The service actually rendered passengers is in substantial respects different from and greater than the services rendered some years ago. There is greater safety, greater comfort and considerable luxury. The introduction of greater cars, the adoption of safety devices and the improvement in passenger terminals have increased both capital and operating costs without any increase in productiveness. On the New York Central a first class coach 70 ft. long, seating 84 persons, weighed 108,000 lb., and cost $10,860 in 1903. The weight of the corresponding steel coach of the same seating capacity in 1913 was 143,000 lb. and the cost $17,050. The weight increased 32 per cent., the cost 57 per cent. and the increased operating and capital cost involved in this change did not bring any increase in productiveness. Sufficient data exist to make it clear that on nearly every railroad the passenger business as compared with the freight has become relatively more burdensome. If during the year 1913 the ratio of expenses to revenues for passenger traffic on the Pennsylvania applicable to 1907 had been maintained, the net revenues would have been $9,859,511 instead of $2,871,694, a difference of $6,987,817.

The unprofitableness of passenger traffic is perhaps more marked in connection with the Pullman car service. Under existing contracts with the railroads that company prospers greatly, but the railroads get no compensation for the heavy expenses incident to the greatly increased service which it renders in hauling the steel Pullman sleeping cars supplemented as they are by smoking, dining and observation cars. The laws on passenger traffic resulting from low fares are, of course, aggravated by the transportation services rendered absolutely free. During the year ended June 30, 1913, 55 roads which answered the question in regard to private cars handled 4,729 private cars, for which the revenue at tariff rates would have been $400,092. This private car service appears to be in large part a mere luxury granted to privileged individuals and as such a demoralizing perquisite power.

Closely allied to the passenger service is the carrying of the mails. Steel cars have been made compulsory, but the government pays no additional remuneration for the added safety and comfort. The special committee appointed by Congress to investigate the compensation of railroads for carrying their mail has not yet made its report. The amount properly payable is a matter not easily determinable, but whatever conclusions may be reached on these matters it seems clear that the railway mail service is at present unremunerative to the carriers.

TERMINAL SERVICE

The growth of our cities has imposed on the railroads ever increasing terminal services in respect to both carload and less than carload freight. The great cities have grown at the expense of the carriers and the rest of the country and this growing expense of terminal service has rendered much freight traffic unremunerative.

Quick despatch freight service constitutes a severe and increasing drain on the carriers' revenue. Another aggravated form of unremunerative rate is furnished on ocean and rail routes through the absorption of the local rate to seaboard.

Assuming the need of additional net revenues to be established, the question remains how it shall be obtained. The railroads made but one suggestion: "Increase all freight rates 5 per cent." That proposal was made, not as a suggestion in the general inquiry undertaken by the commission, but in the form of tariffs filed. These tariffs were suspended and their allowance has been protested against. The commission is therefore called upon to decide specifically whether the rates embodied in the new tariffs are reasonable; and their reasonableness having been challenged, the burden of proof is upon the carrier.

Except as to the C. F. A. scale, no evidence whatever has been introduced by carriers purporting to justify the reasonableness of the proposed rates other than general evidence as to the need of the carriers arising from increased operating expenses, and cost of new capital. The variation of the rate increases from a strict 5 per cent. was explained; but that explanation is obviously not evidence of reasonableness.

The carriers' need of additional revenues, shown to be due to increasing operating expenses, taxes, and capital costs, might, in the absence of controlling evidence to the contrary, conceivably be sufficient to sustain the burden of proof that increased rates are reasonable if the tariff increased all railroad rates proportionately; but in this case we have—

First. The fact that the tariffs submitted do not increase all rates, since no passenger rate is included.

Second. The fact that the freight tariffs submitted in some cases show no increases in rates, and the increases shown are not in the same proportion.

Third. As to many important freight rates proposed, there is direct evidence of unreasonableness.

Hundreds of thousands of rates are involved in the present hearing. Certain general considerations may, of course, apply to all or a large part of these rates; but the railroads must satisfy the minds of the commission that each of these rates is just and reasonable; and the commission has no power to consider the propriety of the rates taken collectively except insofar as their reasonableness is determined by general considerations. Its power is limited to the determination, in the case of each rate, whether in and of itself it is just and reasonable, although each rate should be considered in its relation to other rates and as a part of a "rate structure."

The language of the statute leaves no room for doubt as to the intention of Congress on this point. The statute authorizes a hearing concerning the propriety of a new individual or joint rate. The burden imposed upon the carrier is to justify a rate increased or sought to be increased. No power is given to determine the propriety of a system of rates considered as a whole. Under the law the commission must in effect deal with each rate separately; and the carriers must justify each rate separately.

Except as to the C. F. A. scale the railroads have failed absolutely to sustain this burden; and with that exception there is no legal power in the commission to grant or approve the tariffs.

Though a general need of greater revenues be shown, it seems clear that it should be provided in ways other than through the tariffs filed. The alleged horizontal increase would intensify existing injustice and discrimination in rates. It would give additional revenues where relief is not needed and would fail to give adequate revenues to carriers who are most in need of relief. It would burden some traffic already extremely remunerative to the carriers and exempt from contribution other which is unremunerative. The prosperous coal-carrying roads would have their revenues largely increased. Other roads, less prosperous, having a large passenger traffic, would get a much smaller addition to their revenues.

The impropriety of raising additional revenues by the proposed tariff finds striking illustration in the condition in the C. F. A. territory. There higher rates seem to be required; but relief cannot be had without a readjustment of the rate schedule.

MR. WILLARD'S STATEMENT.

The following is Mr. Willard's final summing up for the railroads:

With your permission I should like to refer, and shall do so

briefly, to certain phases of the case which you have under consideration, and which I can perhaps, because of my position, discuss with somewhat greater freedom than would be the case with counsel.

It has been definitely shown in the record that the railroads, parties to this proceeding, have spent during the last ten years for additions and betterments—meaning of course additional and better facilities for transportation—an amount of new money exceeding $200,000,000 per year, and those who ought to know something of the future requirements of the same carriers, and speaking with a full knowledge of the history of the past, have said that a sum even greater than that will be necessary each year in the future for the purpose of providing such additional facilities and equipment as will be required to keep the carrying capacity of these carriers abreast with the productive growth of the country which they serve, and there is thereby presented a problem, easy or difficult as the case may be, of providing that large sum of new money required each year for such facilities.

The carriers interested in this proceeding, speaking through their executives and counsel, have said that the financial results of the immediate past have not been such as to encourage the expenditure of new money for such facilities by these railroads, and realizing the vital importance of this question to all concerned, and all are concerned, the carriers endeavored to meet the situation by means of new freight schedules which they caused to be prepared and filed with this commission. These schedules provide as nearly as practicable for a small and substantially uniform advance upon all freight carried within the territory affected, such advance being approximately 5 per cent.

The carriers did not overlook the fact that under certain conditions increased revenue might also be obtained from other lines of procedure. They felt, however, that the plan they proposed was under all the circumstances the best and most practicable one at that time, and one of the questions, and, as I view it, the most important question before this commission at the present moment, is, shall the new tariffs now on file be permitted to become effective? In that connection I would like to suggest that should this commission in its wisdom approve of the tariffs just referred to, and should it later on find that any particular rate then in effect ought to be reduced, the commission has ample power to order such reduction—certainly a condition not difficult to deal with.

On the other hand, if this commission should decide to withhold its consent with relation to the new tariffs, then unless those who represent the carriers in this proceeding are wholly mistaken, or worse yet, have intentionally sought to deceive this commission for the purpose of imposing unreasonable rates upon the commerce of this country, the very serious problem will still remain, of how to obtain without undue delay the money with which to provide for the constantly growing business. That those speaking for the railroads have not been wholly mistaken is perhaps indicated by the general apathy which is known to exist at the present time, so far as railroad improvement and betterment is concerned, particularly in the territory served by the carriers involved in this proceeding, and also by the further fact that equipment builders are working today at approximately one-third only of their normal capacity, and that, too, at a time when we are encouraged to believe that the maturing crops will exceed in volume anything in the previous history of this country. Under such conditions as in the past, it has been customary to find the car and locomotive builders working their plants to their fullest capacity, for the purpose of providing the equipment necessary to move the expected tonnage.

At the present moment, whether we approve of it or not, whether we like it or not, and I am sure we do neither, the railroads as a whole, in official classification territory, are compelled by circumstances to follow a policy of enforced economies which, if continued, means less efficient and less satisfactory transportation for that very important part of the United States, and it seems to me that our broad economic policy in that connection should contemplate more and better railroads rather than fewer and poorer railroads. This commission has well said that "Commerce and industry cannot afford to wait on transportation facilities."

During the entire progress of this case it has been the constant aim and desire of those connected with its development, that the utmost care should be used in the preparation of statements and statistics, in order that the true situation might be clearly set forth. We have felt that because of what has come to be the semi-public nature of our employment as railroad officers, the public as well as this commission has a right to expect from us a somewhat more dispassionate attitude concerning the issues involved than would perhaps otherwise be looked for. I hope we have not fallen too far short of that standard.

There is one other matter which, while not strictly in the case, is none the less of the case, and to which I think I ought to refer before closing. Reference has frequently been made during the proceedings to a certain so-called propaganda, supposed to have been promoted by the railroads. Perhaps the best answer we can make to that is a plain statement of what we have done. We have done, or tried to do, two particular things: First, we informed the shippers of our needs and consulted with them as to the best means for supplying those needs, and second, we took steps to keep both them and the general public informed of the facts, both before and after the case was begun.

After the rate decision in 1911, a number of my friends among the shippers said to me that the railroads had made a mistake in that case by not consulting with them—the shippers—before definitely deciding upon a course of action. When it was decided to take the matter up again in the present case, I recalled the advice which my shipping friends had given me before, and to which I have just referred, and I concluded that in this particular instance I would do the thing that we had been criticized for not doing in the former movement, and I may add that my associates were strongly of the same point of view. With that in mind we met committees representing trade associations in Boston, Chicago, New York and other cities for the purpose of discussing with them the needs of the railroads, and we asked their consideration of a plan contemplating a small and substantially uniform increase of all freight charges. This, you will understand, was before any definite action was taken in this case, and we found substantial unanimity in favor of such a course, and it was finally decided to act accordingly. During the development of the case, however, I continued, when opportunity afforded itself, to meet and talk with shippers and trade bodies, as well as with representatives of the press. I explained to them the situation of the railroads as I understood it, and advocated their support of the plan which we proposed, and if what I did in that direction, as just explained by me, is equivalent to promoting and encouraging a propaganda in favor of a uniform advance in freight rates, then I am quite willing to assume full responsibility for so doing; but that anything improper was done in that connection, or that money was spent for the purpose of influencing the press or any other organization, I most emphatically deny. It may be that I have been mistaken in some or many of my statements, but it is most certainly a fact that I believed what I said to be true when I said it, and furthermore, I believe it to be true now. I have felt that I ought, in justice to myself and to the railroads generally, to make this explanation.

In addition to advising with the shippers directly as to our proposed policy, a definite program was decided upon with reference to the press during these hearings. Realizing the complicated character of the questions involved in this case, we have co-operated with the representatives of the press in Washington to the end that they should have clear and accurate statements of the evidence which we have offered. Furthermore, we have prepared short abstracts of the more important por-

tions of the evidence, and distributed them to the press directly throughout our territory.

Of necessity, however, the press could carry only fragmentary accounts of the hearings. We have, therefore, not relied entirely upon such reports as newspapers might make, but have seen to it that these abstracts of the testimony that were presented to the commission were distributed direct to members of Congress, members of legislatures of the state through which our lines run, members of state railroad commissions, officers of trade organizations, and others who were properly entitled to know the facts upon which we based our contentions before this commission.

It must be realized that the problems confronting these carriers go far beyond the scope of this particular proceeding. Yet the facts which we have attempted to bring before the commission in this proceeding are highly illuminating with reference to this general problem.

We have restricted what we have distributed to the press or public to statement of fact actually presented to this commission, and we have sent to the commission itself copies of all materials distributed. Everything we have done has been done frankly and candidly, not to mislead but to inform, and in accord with what we believe were considerations of sound public policy.

There is one other matter to which I also think I ought to make reference. It has been suggested that the carriers have attempted to bring to bear upon the commission undue pressure in favor of a hasty decision, and there again I wish to disclaim any such desire or effort upon my part, or, so far as I know, on the part of any of the carriers connected with this movement. As is natural I suppose, I personally have been very deeply interested in this case, and feeling as I have about the necessities of the carriers, and about the possibilities of the future in case relief could not be obtained, it may be that I at times seemed over-anxious. I hope I have not appeared so to this commission, but if I have, I beg they will understand that it simply reflected unconsciously the earnestness of my belief.

I wish to take this occasion to thank the commission and also its distinguished counsel, on behalf of my associates and myself, for the patience they have shown, and for the many courtesies extended, and while we appreciate fully the great responsibility which rests with the commission because of the magnitude of the problem awaiting its solution, we are confident that because of its full knowledge of the subject, and because—I also venture to say—of its high sense of duty and its courage, it will reach a conclusion just and equitable to all concerned.

STANDARD FREIGHT BILL

The standard freight bill of the Association of American Railway Accounting Officers, form 123, adopted last year, has been approved and recommended by the Interstate Commerce Commission for general use. The size of this bill is 5¾ in. by 8½ in., and the facsimile of the printed portion of the bill reproduced herewith is reduced one-fifth in length. It is reduced correspondingly in height; and also has been further reduced in height by cutting out a part of the blank portion. That is to say, this portion of the bill, on which one entry is shown, has room for six other entries, or seven altogether.

As filled out, the bill is for an imaginary shipment sent from Gloucester, Mass., to Philadelphia, Pa., over the Boston & Maine, the New York, New Haven & Hartford and the Pennsylvania. If the reader is surprised at the very low rate asked for the transportation of shoes, as shown by this bill, he should look at the date at the top of the bill. The imagination of the clerk who made out the bill led him to conjecture that in two years more the natural (?) tendency of rates to fall, accelerated by the unnatural activities of the Interstate Commerce Commission, will have produced the low rate shown!

ACCOUNTANTS' ASSOCIATION STANDARD FORM 123 (REVISED 1913)

FREIGHT BILL

Philadelphia STATION March 31 1916

CONSIGNEE A. French FREIGHT BILL No. 999

DESTINATION

ROUTE B & M Boston - N Y N H & H Jersey City - P R R
(POINT OF ORIGIN TO DESTINATION)

TO NORTH AND SOUTH R. R. CO. DR., FOR CHARGES ON ARTICLES TRANSPORTED:

WAY-BILLED FROM	WAY-BILL DATE AND NO.	FULL NAME OF SHIPPER	CAR INITIALS AND NO.
Boston	Mar. 28 - 888	B. Franklin	777 P R R
POINT AND DATE OF SHIPMENT	**CONNECTING LINE REFERENCE**	**PREVIOUS WAY-BILL REFERENCE**	**ORIGINAL CAR INITIALS AND NO.**
Gloucester 66	666		555 B & M

NUMBER OF PACKAGES, ARTICLES AND MARKS	WEIGHT	RATE	FREIGHT	ADVANCES	TOTAL
40 Cases Shoes 4444-4483 inc.	2000	10	2.00	1.00	3.00
*TOTAL PREPAID $					

RECEIVED PAYMENT March 31, 1916 TOTAL,

John Smith AGENT

*FOR USE AT JUNCTION POINTS ON FREIGHT SUBJECT TO CONNECTING LINE SETTLEMENT.

The rules printed on the back of the freight bill are as follows:

RULES

1. This form must be prepared with typewriter, pen or indelible pencil; all information called for to be shown in full and in a clear and legible manner.

2. Weight, rate and charges must be shown in detail for less carload shipments.

3. Demurrage, switching, icing or other miscellaneous charges not included in the rate for transportation must be stated in detail, and the points at which such charges accrued, shown.

4. When charges are assessed on track scale weights, gross, tare and net weights on which charges are based and name of weighing station, must be shown.

5. The route over which the shipment moved from point of origin to destination, including the initials of each carrier and name of each connecting line junction point, must be shown.

6. Over-charges will be refunded only on presentation of original paid freight bills.

7. Original paid freight bills should accompany claims for over-charge, loss or damage.

8. All freight will be subject to demurrage or storage charges, or both, as provided in published tariffs.

RAILWAY CONSTRUCTION IN SPAIN.—A concession has recently been granted for the construction of a narrow gage railway from Guardiola to Gisclareny in the province of Barcelona.

Articulated Locomotive With One Engine on the Tender

The Triplex Compound Recently Completed for the Erie Embodies a Number of Interesting Features

By R. S. Mounce

[With an Inset]

The Baldwin Locomotive Works have just completed a new type of articulated locomotive for the Erie Railroad which marks a distinct step in locomotive construction. It is called the Triplex Compound or "Centipede" type, and, as the name implies, goes beyond the well-known Mallet articulated type by the addition of another pair of cylinders and another group of driving wheels, making three complete engines in one locomotive unit.

The principle of compounding, which involves the use of two high pressure and four low pressure cylinders, originated with and is patented by G. R. Henderson, consulting engineer of the Baldwin Locomotive Works. The design was prepared by that company and incorporated ideas suggested by Wm. Schlafge, general mechanical superintendent of the Erie, who co-operated with them in the various details.

This locomotive is the largest and most powerful ever constructed. The Santa Fe 2-10-10-2 Mallets*—converted from 2-10-2 freight locomotives—which have up to the present been the heaviest, have a total weight, engine and tender loaded, of 850,000 lb. as against 853,050 lb. for the Erie Triplex. The most powerful locomotives on record, previous to this time, were the four low pressure, the high pressure pair driving the middle group of wheels. The right high pressure cylinder exhausts into a receiver which supplies the front pair of low pressure cylinders, and the left high pressure supplies the rear pair in a similar manner. This arrangement gives a volume ratio of one to two, which is the usual ratio between the high and the low pressure cylinders in compound locomotives.

BOILER

The boiler has unusually large proportions, exceeding in some respects, especially in its heating surfaces, those applied to the Virginian Mallet type locomotive previously mentioned. The barrel has one conical course. At the front end it measures 94 in. in diameter and at the dome ring 108⅛ in. The circumferential seams are triple riveted; the longitudinal seams have sextuple riveted butt joints welded at the ends, and have an efficiency of 90 per cent. Since the firebox is set over three pairs of 63 in. diameter driving wheels, the throat sheet is necessarily quite shallow.

There are 326-2¼ in. tubes and 53-5½ in. superheater flues, 24

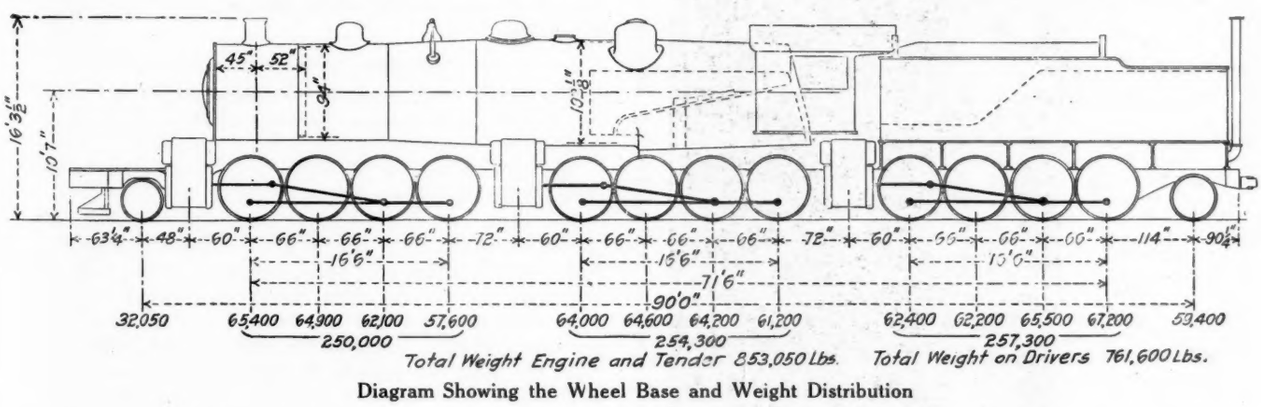


Diagram Showing the Wheel Base and Weight Distribution

Virginian 2-8-8-2 Mallet.† These locomotives have a theoretical tractive effort, working compound, of 115,000 lb. as compared with 160,000 lb. for the Triplex.

The new locomotive is to be used for pusher service on the eight mile grade east of Susquehanna, Pa., which averages 56 ft. to the mile. Full tonnage trains are now handled over this portion of the main line by a Consolidation lead locomotive with two Consolidations and a Mallet as pushers. The Triplex Compound has a tractive effort equal to the combined tractive effort of the three pushers now used. The capacity of this locomotive is not obtained by using excessive wheel loads or an unusually long wheel base, but is secured by placing the third engine under the tender, thereby taking advantage of a very large weight for adhesion which has heretofore been a dead load requiring considerable power to haul, especially on heavy grades. The wheel arrangement is 2-8-8-8-2 and the total wheel base is 90 ft. The locomotive will operate over any curve up to and including 16 deg.

All of the cylinders are equal in size, having a diameter of 36 in. and a stroke of 32 in. Two cylinders are high pressure and

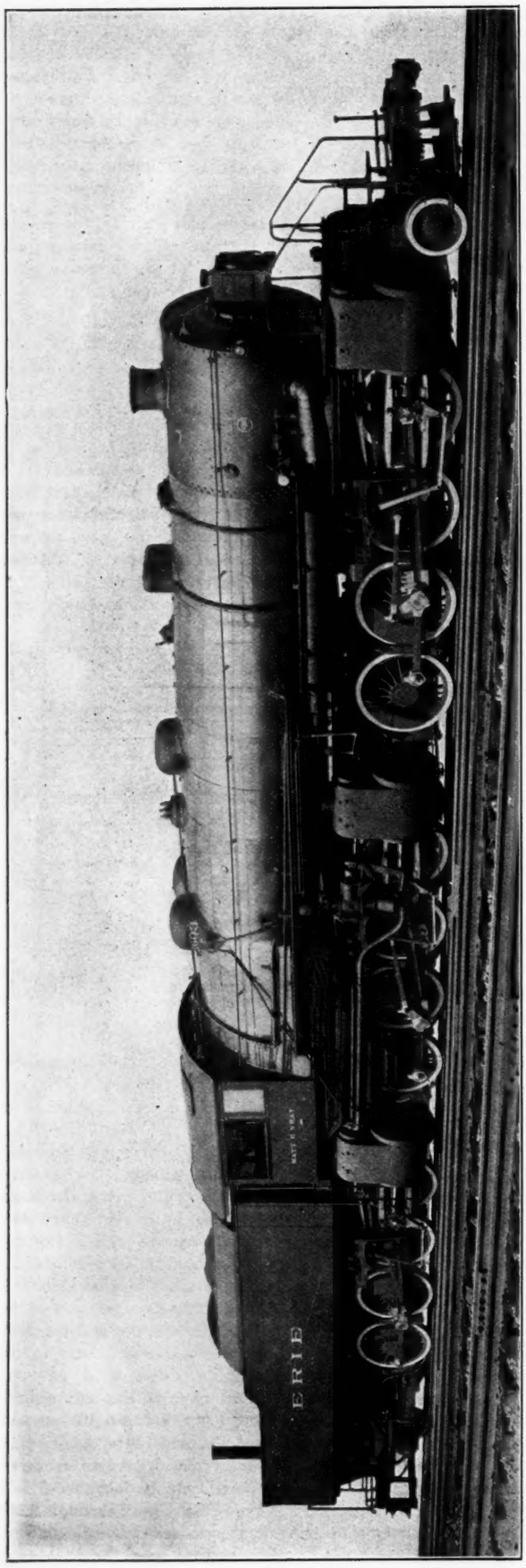
ft. long. In order to keep this length within the limits of good practice a combustion chamber 54 in. long is used.

Clearance limits required a very short dome, which is of pressed steel 33 in. in diameter and 13 in. high. In this a Chambers throttle valve is fitted, and is connected to an inside dry pipe in the usual manner. The safety valves are mounted on a steel casting, which is but slightly higher than the boiler shell. Instead of one large sand box on top of the boiler, there are two comparatively small ones, arranged symmetrically and mounted 48 in. between centers. The bell and the whistle are placed on the round of the boiler at the left side, 30½ and 32 in. respectively from the vertical center line. Two sets of top boiler check valves are used, one for the injectors and the other for the hot water pumps, which will be described later in this article.

The firebox is of the radial stayed type, with a full installation of Tate flexible bolts. It is 162 in. long and 108 in. wide at the mud ring. The grates extend forward 120 in. to the point where a Gaines brick wall separates the fire space from the combustion space. The brick arch is supported by six 3½ in. arch tubes, and is supplemented by the brick wall through which heated air is delivered by seven 3 in. pipes, placed vertically in it. The fire doors are of the Franklin vertical type, two in number,

*For description of Santa Fe 2-10-10-2 Mallet locomotives see *American Engineer and Railroad Journal*, May, 1911, page 171.

†For description see *American Engineer*, June, 1912, page 287.



Triplex Compound Locomotive Built for the Erie Railroad by the Baldwin Locomotive Works

placed 32½ in. between centers. The locomotive will be fired by a Street mechanical stoker.

The Schmidt superheater is the largest ever applied to a locomotive, having 53 elements and 1,584 sq. ft. of superheating surface. The header is divided, separate castings being provided for the saturated and the superheated steam.

The front end contains a single exhaust nozzle with a ring type blower. The nozzle is rectangular in shape, and is adjustable, longitudinally, by means of a pair of deflectors mounted on square shafts which are operated from the outside of the smoke box by a right and left hand screw connected to arms on the square shafts. The operating device is located just ahead of the superheater damper regulator. The nozzle may be varied from about 7 by 9 in. to 7 by 3 in. The smoke stack is 22 in. in diameter, and its internal section extends down to the center line of the boiler.

STEAM PIPES

Steam passes from the superheater to the high pressure cylinders through outside steam pipes, which are fitted with a ball joint and a sliding joint. The high pressure cylinder saddle has two passages cored in it, one leading from the right exhaust chamber to the front receiver pipe, and the other from the left exhaust chamber to the rear receiver pipe. These receiver pipes are flexible, having the usual ball and sliding joints. They convey the high pressure exhaust to the two sets of low pressure cylinders. The front low pressure cylinders exhaust to the stack in the usual manner, through a flexible pipe, whereas the rear low pressure exhaust is carried back the full length of the tender, and is discharged through a vertical pipe at the back end of the tank. Between these cylinders and the exhaust pipe is a feed water heater, which will be described in a following paragraph.

CYLINDERS, VALVES AND VALVE GEAR

The cylinders are separate from their respective saddles, and are all cast from the same pattern. Cylinders and valve chambers are fitted with Hunt-Spiller metal bushings.

The main valves are all 16 in. in diameter, arranged for inside admission, and are driven by the Baker valve gear.

The three sets of valve gear are controlled simultaneously by the Ragonnet power reverse gear. The reverse shaft for the high pressure engine is located just back of the high pressure cylinders, that for the front engine immediately ahead of the same cylinders, and that for the rear engine directly back of the rear cylinders. These shafts are connected by flexible reach rods, the front one passing through the high pressure cylinder saddle, and the rear one through the ash pan and rear cylinder saddle, guides being provided in the saddles and the flexible joint arranged in the form of a rod and crosshead.

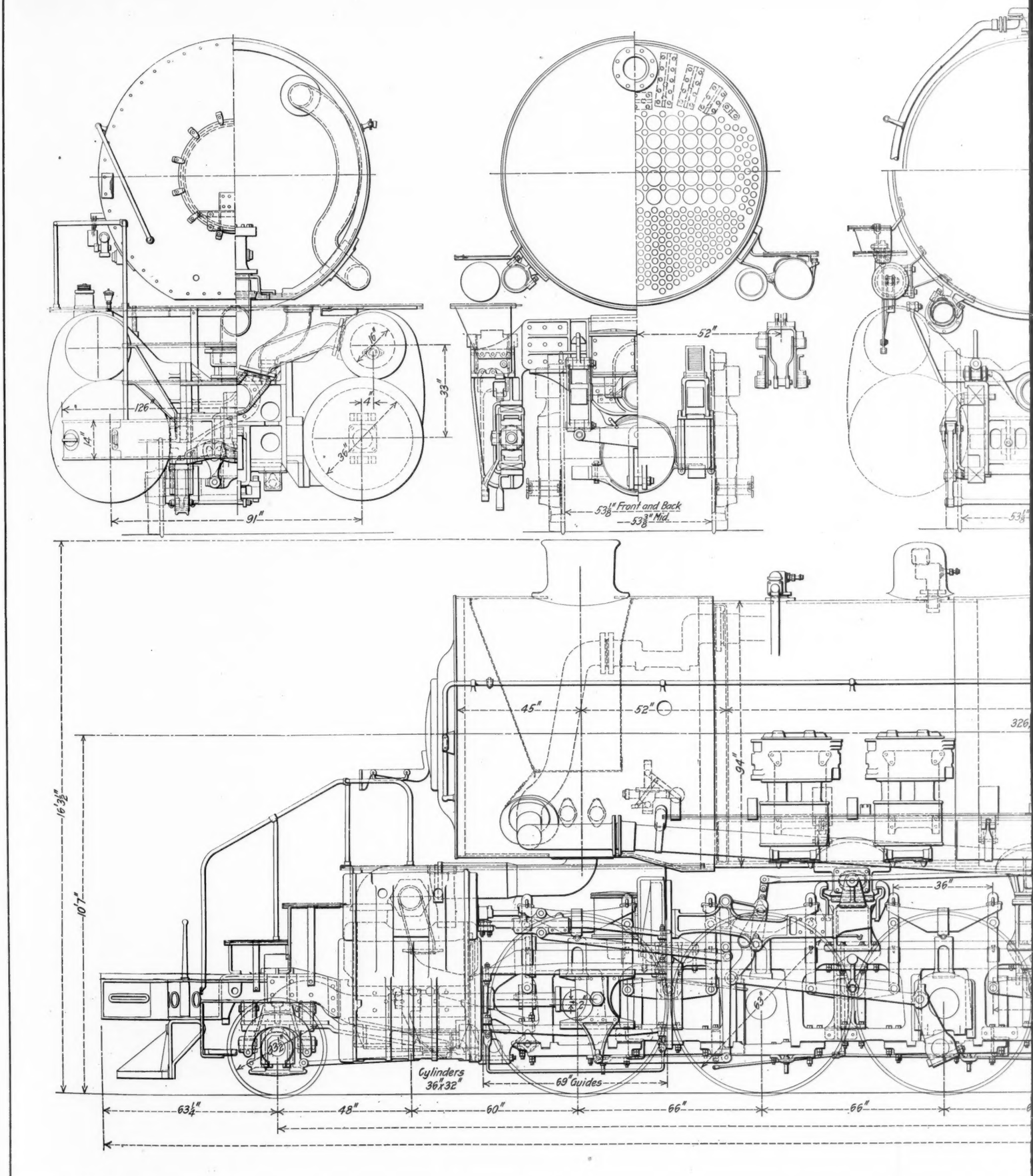
TENDER

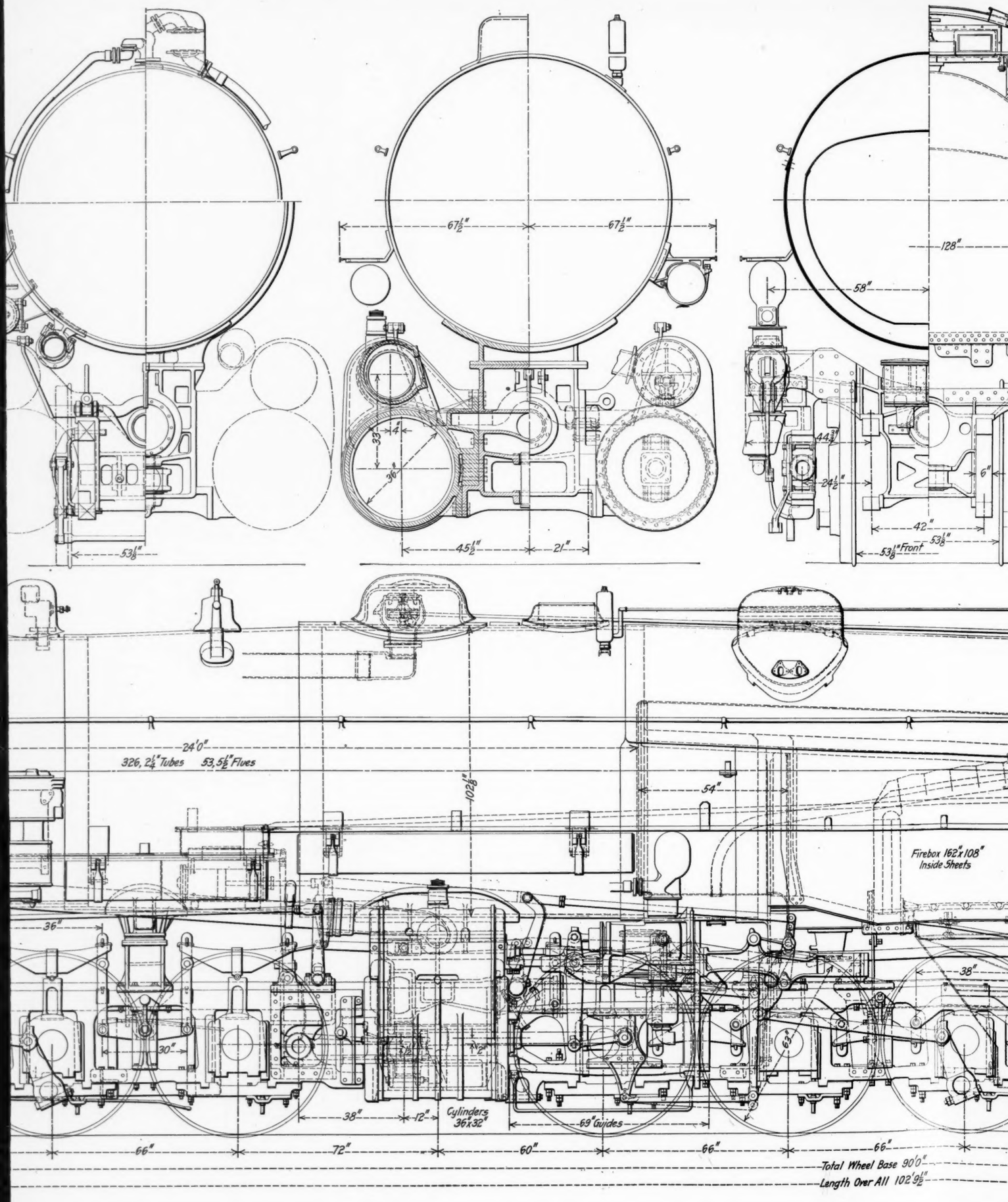
The arrangement of the tender section of the Triplex, is, in many respects, very similar to that of an ordinary steam locomotive. The frames, wheels, driving gear and spring rigging are very much the same as those on the other two sections. The tank is supported on the frames by six cast steel bearers, which act as transverse frame braces as well. Three of these are placed between adjacent pairs of driving wheels, one back of the fourth pair of drivers, one above the trailing truck, and the other under the back end of the tank, which is 10 ft. 8 in. wide, and is placed high enough to clear the valve gear. The water capacity is 10,000 gal., and the coal capacity 16 tons.

FRAMES

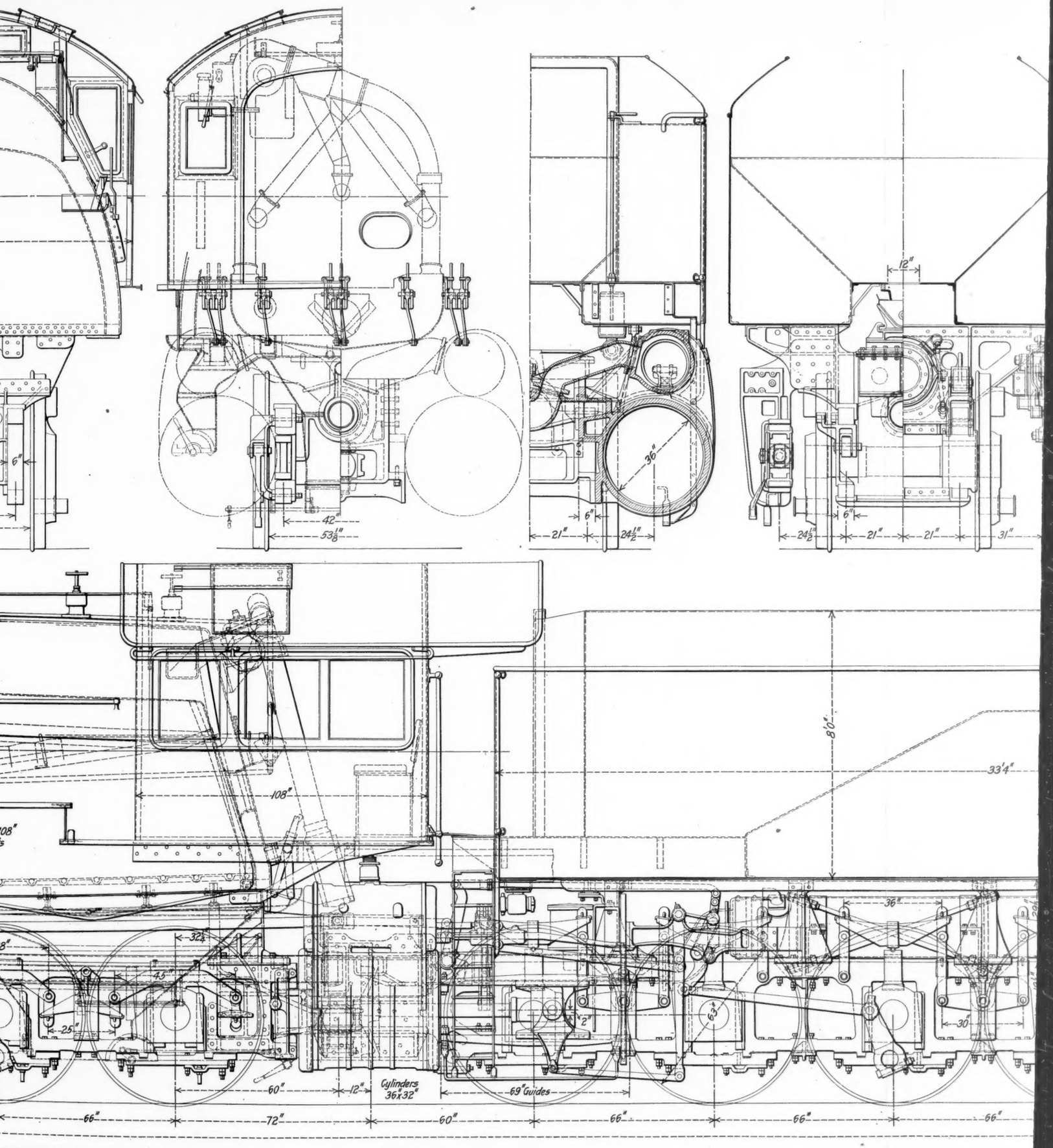
The frames are vanadium steel castings, 6 in. thick, and with the exception of those in the tender section, each frame is in one piece, the front portions being a single slab to which the cylinders and saddles are securely bolted and keyed. The rear frames differ from the other four in that they are each in two pieces, the construction usually employed with outside bearing trailing trucks having been followed.

The articulated connection between the middle and front

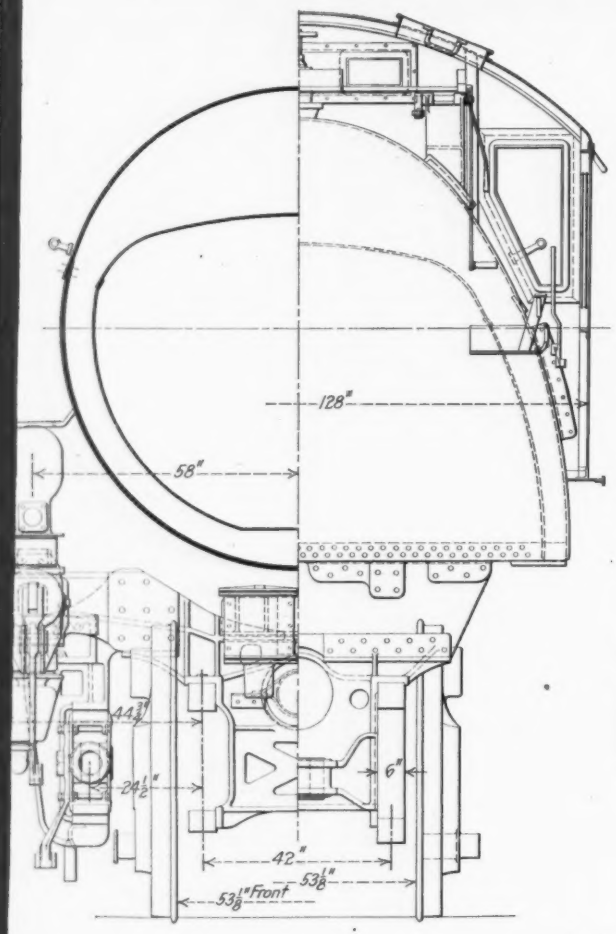

126"
14"
91"
4"
36"
33"
52"
53 1/8" Front and Back
53 3/8" Mid.
45"
52"
94"
16'3 1/2"
10'7"
36"
63"
Cylinders
36"x32"
69" Guides
63 1/4"
48"
60"
66"
66"

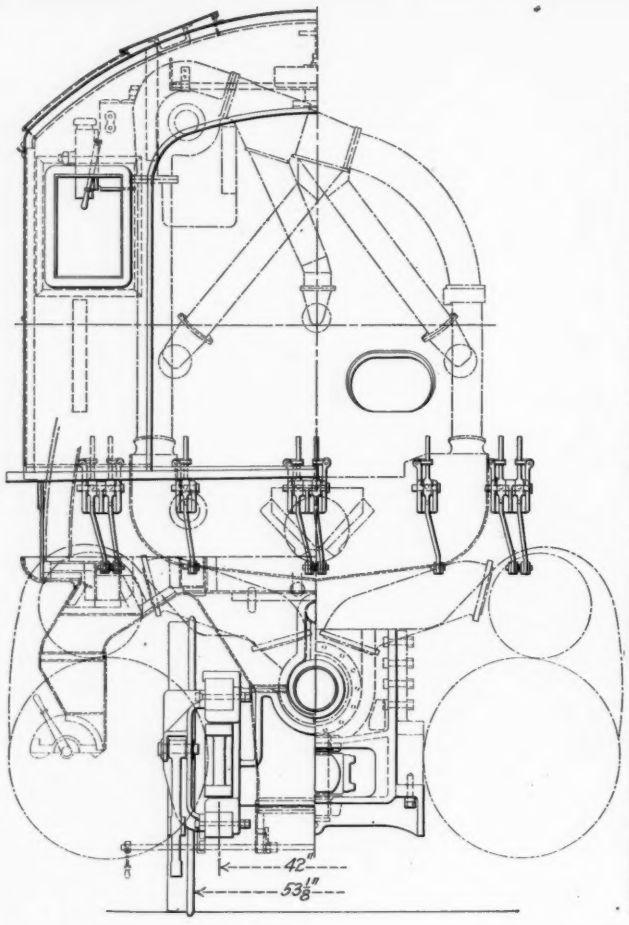


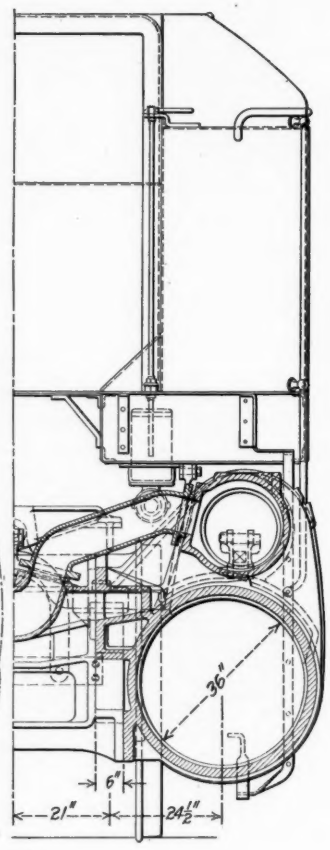
Triplex Compound Locomotive Built for the Erie Railroad by the Baldwin Locomotive Works; T

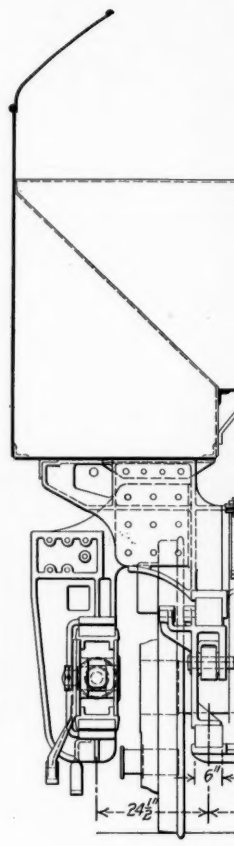


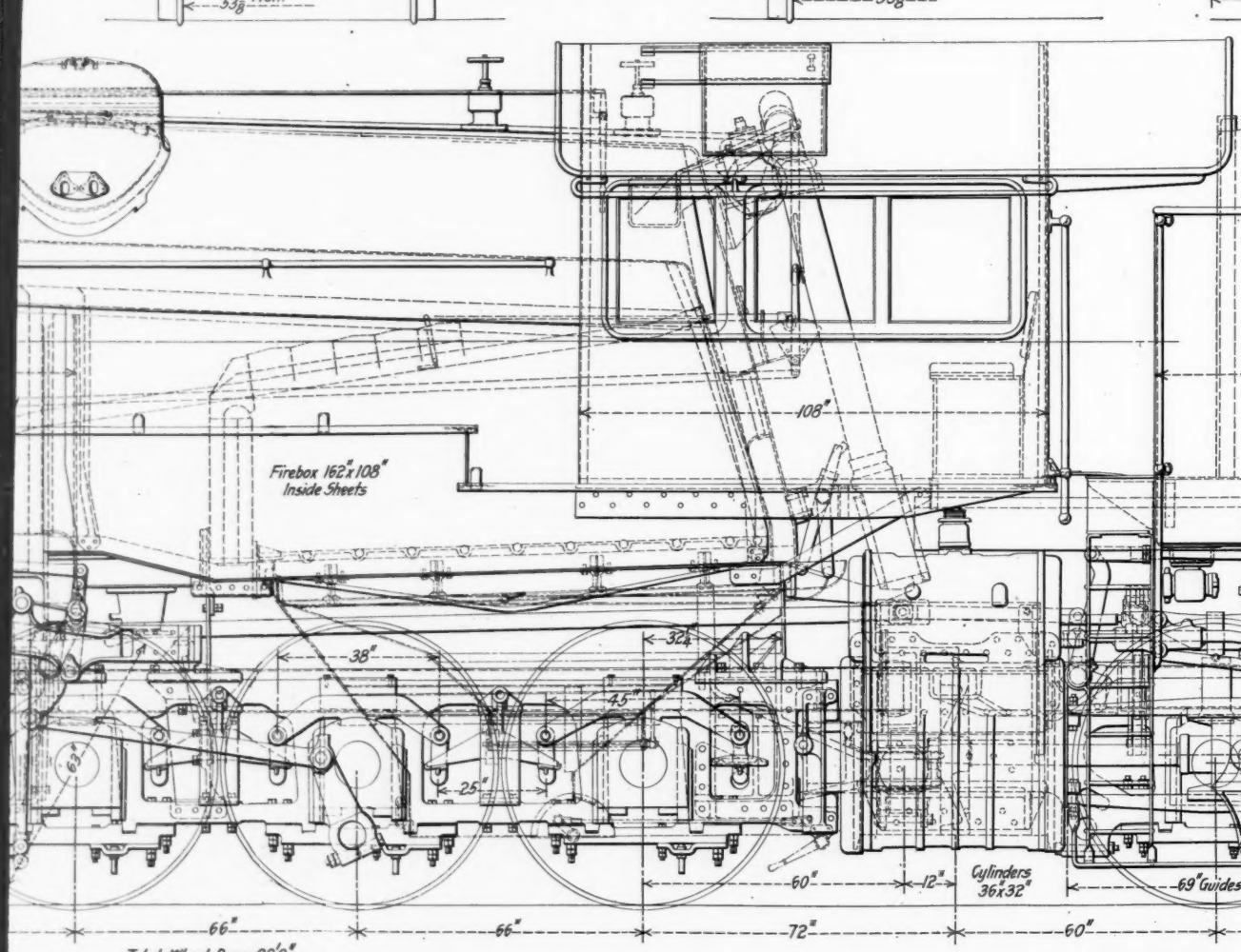
orks; Total Weight, 853,000 lb.; Theoretical Tractive Effort, 160,000 lb.



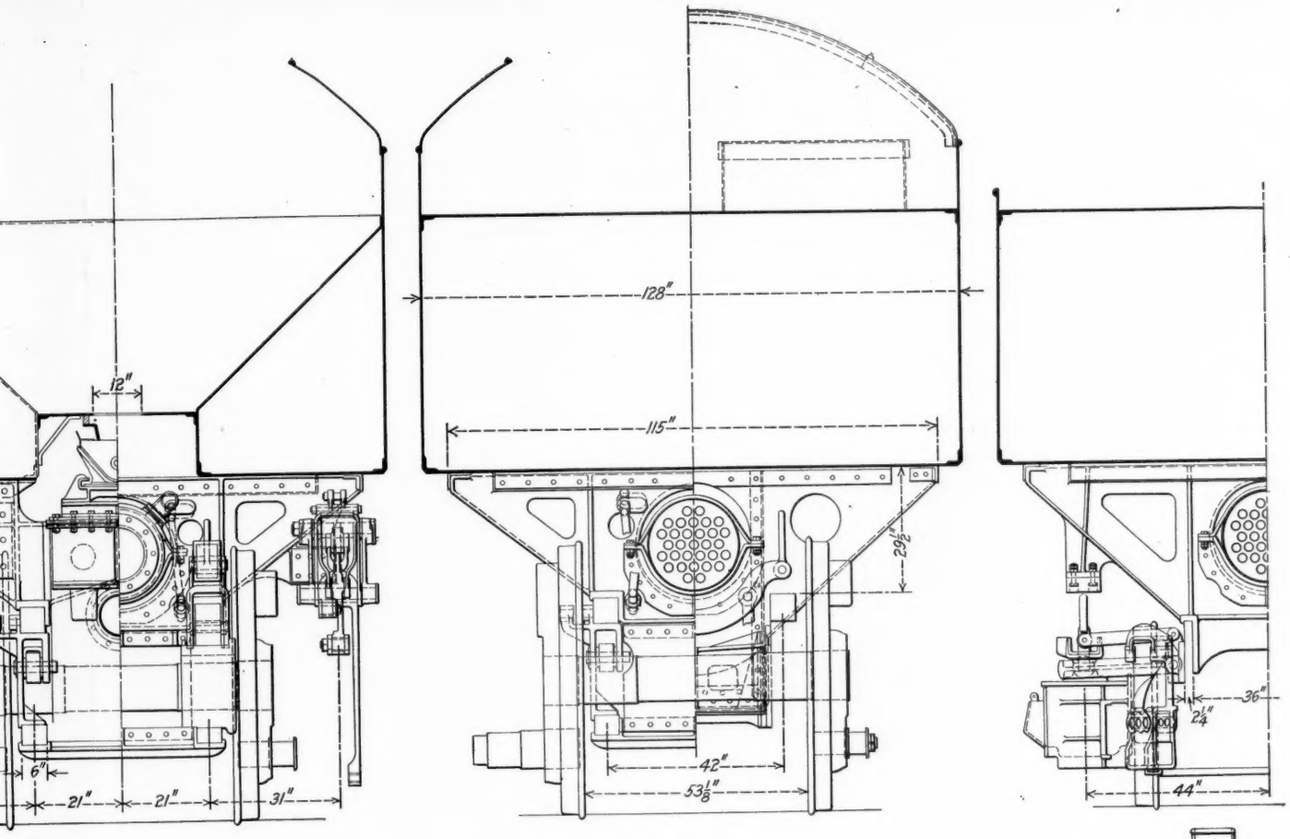


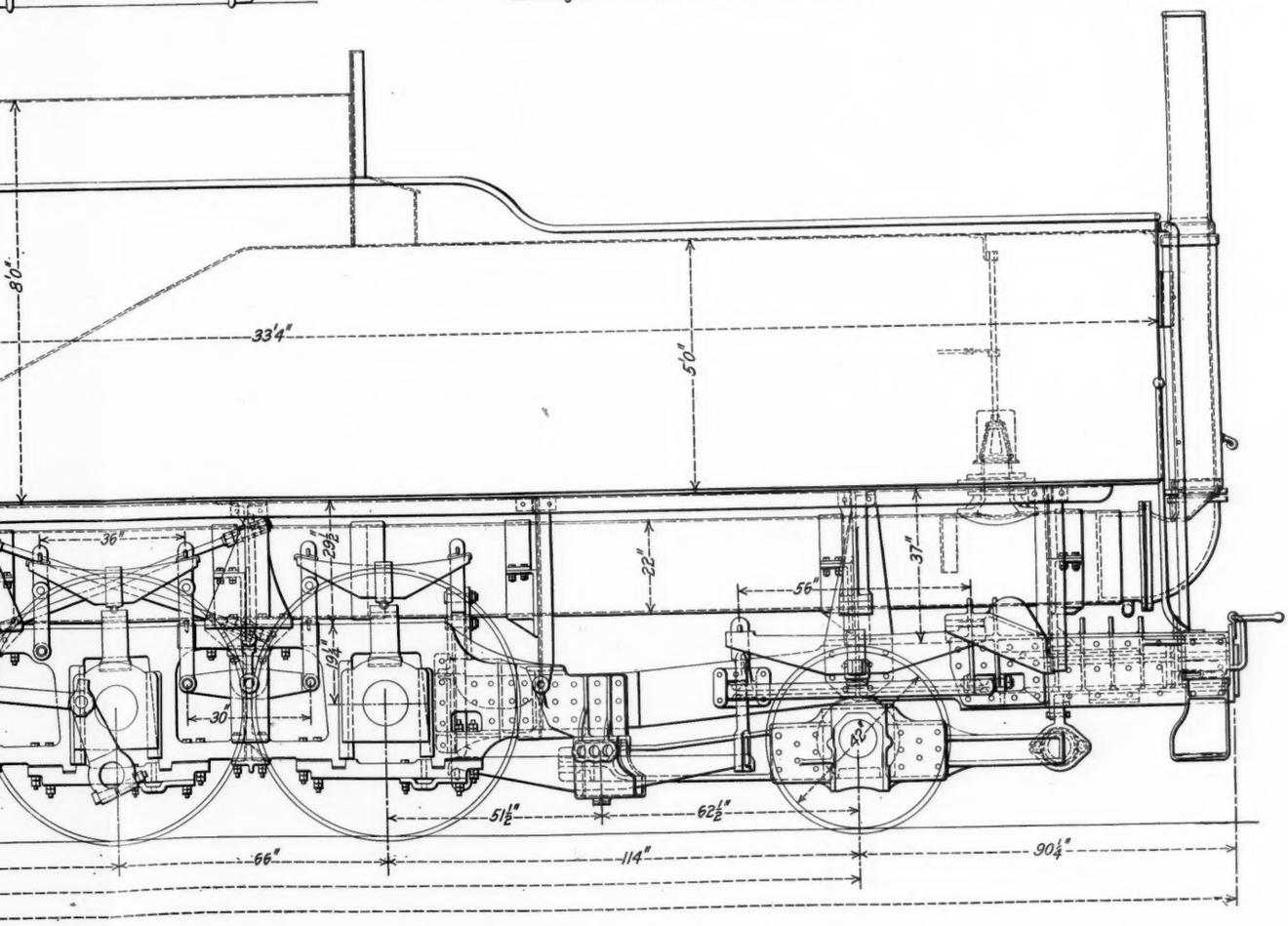






road by the Baldwin Locomotive Works; Total Weight, 853,000 lb.; Theoretical Tractive Effort, 160,000 lb.


12"
128"
115"
29½"
6"
21"
21"
31"
42"
53⅛"
24"
36"
44"


8'0"
33'4"
50"
36"
29½"
22"
37"
56"
19¼"
30"
42"
51½"
62½"
66"
114"
90¼"

frames gives flexibility both vertically and horizontally. The radius bar is attached to the front frames by a horizontal pin, which provides for the vertical movement. It makes a ball joint connection with the hinge pin under the high pressure saddle. The connection between the middle and rear frames is placed under the cab. It is similar to the other connection, except that the radius bar is rigidly attached to the middle frames, and obtains its flexibility from the ball jointed arrangement at the hinge pin under the rear cylinder saddle.

The spring equalization has been carefully worked out, and is arranged as follows:

First engine—The engine truck being of the center bearing type, the equalization is continuous, and the arrangement is similar to that generally used on consolidation type locomotives.

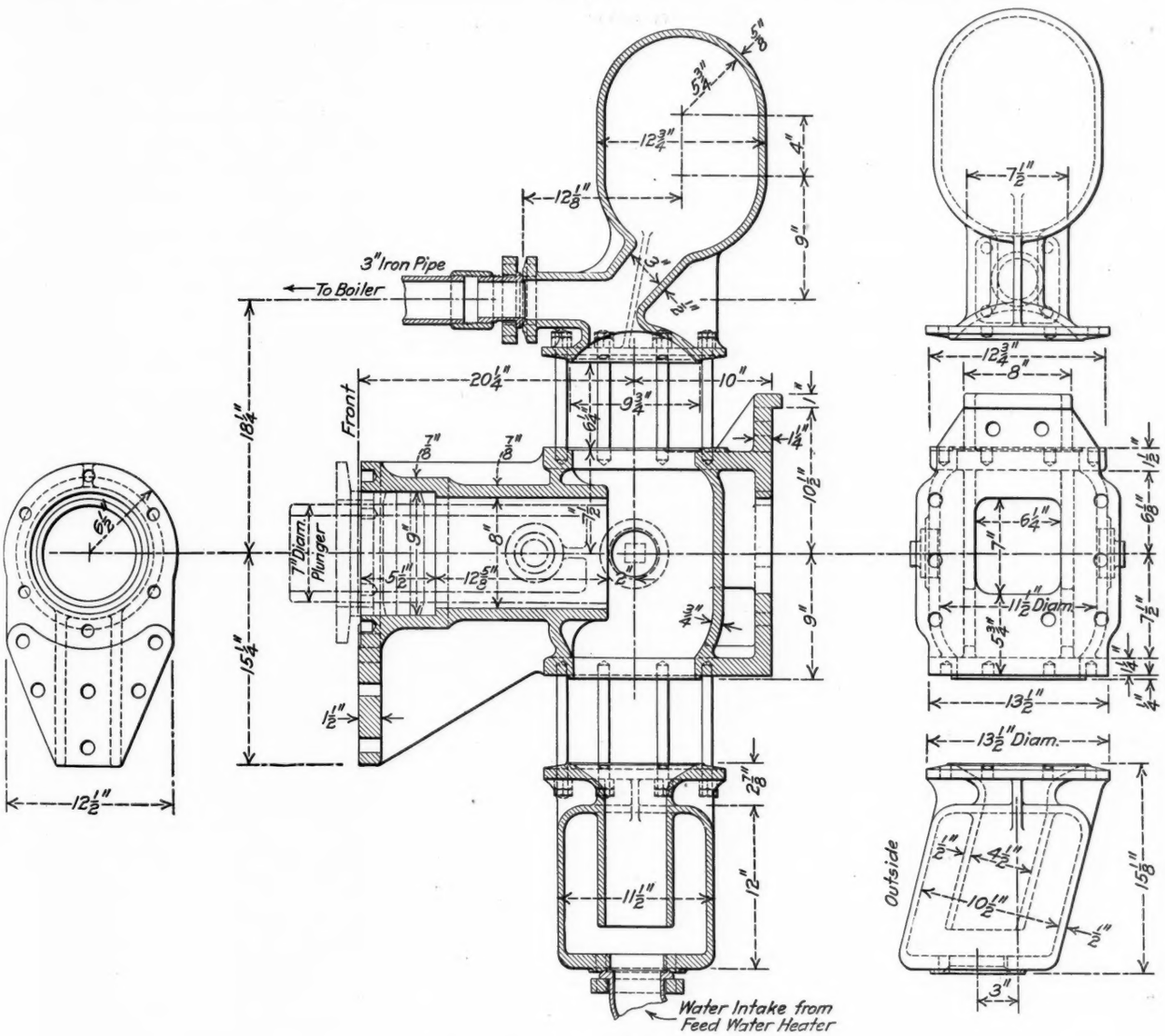
Second engine—The equalization is continuous on each side without cross connection.

Third engine—The first and second drivers are equalized together, each side independently of the other. The third and fourth drivers are equalized with the trailing truck.

FEED WATER HEATER, HOT WATER PUMPS AND INJECTORS

The Triplex locomotive, in addition to its many unusual constructive features, has a novel system of feed water heating and boiler feeding. A study of the locomotive ratios might lead one to believe that the locomotive is over-cylindered in respect to heating surface. This, however, should not be the case, because it is intended to supply feed water to the boiler at a temperature not below 200 deg. Fahrenheit.

The feed water heater is a long drum, running longitudinally under the center of the tank. It is 20 in. inside diameter, and contains 31-2¼ in. tubes, each about 24 ft. long. This drum forms a part of the rear low pressure exhaust passage, and is arranged so that the exhaust steam passes through the tubes, giving up some of its heat to the water which surrounds them. The water enters the drum through a special valve at the back end, and leaves at the front end, from which it is fed to the hot water pumps.



Arrangement of the Boiler Feed Pump

The hot water pumps are single acting, and each has one 7 in. plunger. The pumps are two in number, one on each side, bolted to the high pressure guide yoke and driven by the crossheads by means of a simple lever, which gives the plungers a stroke of 10 in. The supply of water to these pumps is regulated by a valve in the cab.

The locomotive has two Hancock, type LNL injectors, each of 7,500 gal. per hour capacity. They draw cold feed water from the front end of the tank, and are to be used when the locomo-

tive is not in motion, or if for any reason the hot water pumps are unable to supply sufficient quantities of water to the boiler.

RUNNING GEAR

The pistons, all of which are alike, have cast steel dished bodies, surrounded by a cast iron bearing ring. Each of these rings has three packing ring grooves, and is secured to the piston by a retaining ring, electrically welded in place. The packing rings, both for the cylinders and valve chambers, are of Hunt-Spiller metal.

The driving wheels and rods, valve gear and a number of other details are, as far as it was possible to make them so, interchangeable among the three engines. Many of these parts are also interchangeable with those used on the heavy mikado type locomotives now in operation on the Erie.

ASH PAN

The placing of driving wheels under the firebox, together with the necessity of passing the receiver pipe for the rear low pressure cylinders between the frames, very greatly restricted the space available for ash pan hoppers. It was, therefore, necessary to apply an additional hopper to each side of the ash pan far enough from the driving wheels to clear the driving rods. Ample air space has been supplied, for, in addition to the enclosed side openings provided for in the Talmage ash pan, an opening 60 in. by 8 in. has been cut in the outside sheet of each of the side hoppers, and two openings 12 in. by 12 in. were cut in the front sheet of the main hopper. These openings are covered with netting, and shields have been provided where necessary in order to prevent sparks from falling through.

LUBRICATION

Two Chicago bull's-eye type lubricators, each with four feeds, are provided for lubricating the valves and cylinders, the steam cylinders of the air pumps, and the stoker engine. The several feeds are distributed as follows: One to each high pressure valve chamber, one to each high pressure cylinder, one to each receiver pipe leading to the low pressure cylinders, one to the air pumps, and one to the stoker engine. In addition to the lubrication supplied to the low pressure cylinders by the exhaust steam from the high pressure cylinders, and by the oil fed into the receiver pipes, small auxiliary static oilers are applied to each low pressure valve chamber.

Flange lubrication is provided for four pairs of driving wheels as follows: First pair of front low pressure engine, first and fourth pairs of high pressure engine, and fourth pair of rear low pressure engine. In every case the feeds are applied behind the wheel. Two Chicago four-feed flange oilers are used for this purpose.

All driving boxes are fitted with Elvin lubricators, and the engine truck and trailer journal boxes are filled with oil-soaked wool waste.

OTHER DETAILS

The two sand boxes previously mentioned are piped so as to convey the sand in front of the first and back of the fourth pairs of driving wheels of the high pressure engine. There is an auxiliary sand box in the front low pressure cylinder saddle, which supplies sand in front of the first pair of driving wheels of this engine. For the rear engine a sand box is built around the rear low pressure exhaust pipe at the back end of the tank, and supplies sand back of the rear driving wheels of the third engine. White double air sanders are used throughout.

The starting valve is manually operated, live steam being admitted to the four low pressure cylinders by way of the high pressure exhaust cavities, and thence to the receivers.

Miner friction draft gear, type A-42, has been applied both at the back and front ends of the locomotive. Okadee drain valves have been applied as follows: One in each cylinder exhaust cavity, one in each air pump steam pipe, one in each injector delivery pipe, and one in the blower pipe. Among the specialties which have not been mentioned in other connections are: Air pumps, two New York, No. 5-A; cylinder cocks, Hancock pneumatic; piston rod and valve stem packing, King type; flexible air connections between engine and tender, McLaughlin; headlight, Dressel; water gage, Klinger type; engine truck wheels, solid steel; safety valves, Consolidated.

The efficiency of a locomotive used in slow, heavy service is largely proportional to the percentage of total weight available for adhesion. In this respect the Mallet Triplex excels all previous designs, having 89 per cent. of the total weight of the engine and tender on the drivers. In large Mallets of the 2-8-8-2 type this ratio is not above 65 per cent. This gain is the result of converting the tender from a dead load to an adhesive weight.

The general dimensions, weights and ratios are given in the following table:

General Data

Gage	4 ft. 8½ in.
Service	Pusher
Fuel	Bituminous coal
Tractive effort, compound	160,000 lb.
Weight on leading truck	32,050 lb.
Weight on first group of drivers	250,000 lb.
Weight on second group of drivers	254,300 lb.
Weight on third group of drivers	257,300 lb.
Weight on trailing truck	59,400 lb.
Total weight on drivers	761,600 lb.
Total weight of engine and tender in working order	853,050 lb.
Wheel base, driving, each group	16 ft. 6 in.
Wheel base, total driving	71 ft. 6 in.
Wheel base, total engine and tender	90 ft. 0 in.

Ratios

Weight on drivers ÷ tractive effort	4.76
Total weight ÷ tractive effort	5.33
Weight on drivers ÷ total weight of engine and tender	.89
Tractive effort × diameter of drivers ÷ total equivalent heating surface*	1,088.32
Total equivalent heating surface* ÷ grate area	102.91
Firebox heating surface ÷ total equivalent heating surface*, per cent	4.12
Weight on drivers ÷ total equivalent heating surface*	82.23
Total weight ÷ total equivalent heating surface*	92.10
Volume of equivalent simple cylinders, cu. ft.	51.32
Total equivalent heating surface* ÷ volume of cylinders	180.48
Grate area ÷ volume of cylinders	1.75

Cylinders and Valves

Diameter and stroke—2 H. P. and 4 L. P.	36 in. by 32 in.
Kind of valves	Piston
Diameter of valves	16 in.
Type of valve gear	Baker

Wheels

Driving, diameter over tires	63 in.
Driving, thickness of tires	3½ in.
Driving journals, diameter and length	11 in. by 13 1/16 in.
Engine truck wheels, diameter	33½ in.
Engine truck journals	6 in. by 12 in.
Trailing truck wheels, diameter	42 in.
Trailing truck journals	9 in. by 14 in.

Boiler

Style	Conical
Working pressure	210 lb.
Outside diameter of first ring	94 in.
Firebox, length and width	162 in. by 108 in.
Firebox plates, thickness	⅜ in. and ⅝ in.
Firebox water space	F., 6 in.; S., 5 in.; B., 5 in.
Tubes, number and outside diameter	326—2¼ in.
Flues, number and outside diameter	53—5½ in.
Tubes and flues, length	24 ft.
Heating surface, tubes	6,418 sq. ft.
Heating surface, arch tubes	88 sq. ft.
Heating surface, firebox and combustion chamber	380 sq. ft.
Heating surface, total	6,886 sq. ft.
Heating surface, superheater	1,584 sq. ft.
Heating surface, total equivalent*	9,262 sq. ft.
Grate area	90 sq. ft.

Tender

Water capacity	10,000 gal.
Coal capacity	16 tons

*Total equivalent heating surface = evaporative heating surface + 1.5 times superheating surface.

THE AUSTRALIAN TRANSCONTINENTAL RAILWAY.—When the transcontinental railway which the Australian Commonwealth is now building to connect Port Augusta in South Australia with Kalgoorlie in Western Australia is completed, it will be possible to travel by rail from Rockhampton in Queensland via Brisbane, Sydney, Melbourne and Adelaide to the western coast of the continent, a journey of about 4,500 miles. The gage of the railroad is 4 ft. 8½ in. The gage of the railways of Queensland is 3 ft. 6 in.; of New South Wales, 4 ft. 8½ in.; and of Victoria and South Australia, 5 ft. 3 in.

Rebuilding 275 Miles of Milwaukee's Line in Iowa

Construction of 326 Bridges Including a Steel Tower and Girder Viaduct 130 Ft. High and 2,400 Ft. Long

The Chicago, Milwaukee & St. Paul has practically completed a second track on its main line across Iowa during the last two seasons, involving reductions in grades, elimination of curvature, the separation of highway and railway grades and the construction of 326 bridges. The traffic conditions which made advisable the expenditure of the $18,000,000 required for this improvement and the details of the grading operations were described in the *Railway Age Gazette* of March 20. The following article covers only the bridge work.

EXTENT OF WORK AND ORGANIZATION USED

The improvements extend from Green Island, Iowa, on the Mississippi river 15 miles west of Savanna, Ill., to Manilla, Iowa, 62 miles east of Omaha, a total distance of 275.7 miles on the old line and 271 miles on the new. For construction purposes the line was divided into five districts, each in charge of an assistant engineer with three or four resident engineers reporting to him. In addition to the usual duties of engineers on such improvement work, the assistant and resident engineers had charge of the concrete construction, all of which was handled by company forces. The following table shows a condensed statement by districts of the amount of this work handled and the number of men required.

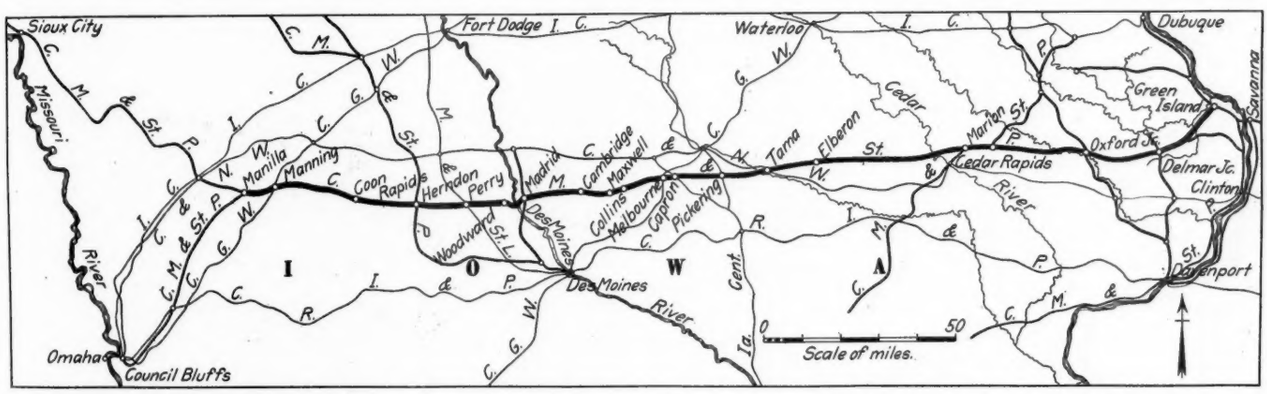
	Districts					
	First	Second	Third	Fourth	Fifth	Total
Number of structures.....	60	54	117	38	57	326
Yardage of concrete.....	19,415	18,359	38,000	32,000	30,000	137,774
Company force—						
Foremen	14	14	14	39	14	95
Men	478	220	278	1,100	450	2,516

The fabrication of steel work was contracted and the erection was handled with company forces.

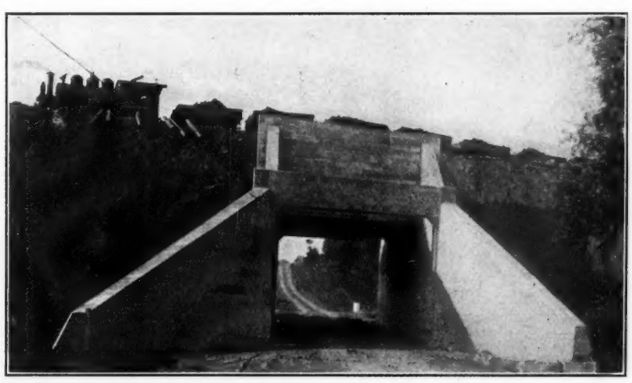
Some trouble was experienced in securing enough satisfactory hobo labor for the concrete gangs, with the results that Slavic and southern European laborers with a few Mexicans and negroes were taken in preference to hobos. The current day rates for these laborers were $2.75 to $3 for carpenters; $2.50 for pile driver helpers; $2.25 for carpenter helpers, and $2 for ordinary laborers. The foremen received from $90 to $110 per month. No standard plant layout was adopted, the local conditions at each structure being met in the best possible way with the available equipment. Mixers of various types, including the Smith, Chicago cube, Chain Belt, and the Milwaukee were used, some being driven by steam and some by gasolene engines. Elevating hoppers were found very successful in a number of cases for charging and Chain Belt and Insley towers were used in some cases for distributing the material. Koppel cars were also used with some of the plants for placing concrete. As an indication of the results secured by this organization the records on one district show that the average unit price for more than 25,000 yd. of concrete including all charges except transportation of material over the company's lines, train service, depreciation and interest on plant and equipment, transportation of men and equipment, and liability insurance was a little over $13. This yardage was placed in numerous structures such as box and arch culverts, concrete bents for overhead highway bridges and concrete abutments for deck girder spans. The smallest individual yardage was 55 yd. placed in two concrete bents under a steel girder span in an overhead highway bridge, and the largest job was 2,863 yd. in a 36 ft. reinforced concrete arch.

GENERAL TYPES OF STRUCTURES

Both cast iron and concrete culvert pipe were used, the former in sizes from 20 in. to 48 in., and the latter from 24 in. to 48 in. The smallest arch culvert was 5 ft. by 4 ft. and the smallest box culvert 6 ft. by 6 ft. The standard highway undercrossing is the same in design as the reinforced concrete box culvert except that the barrel is shorter to provide better light. A number of reinforced concrete subways similar to those built in city track elevation work were used in towns along the line where it was possible to separate grades. Of the 48 highway bridges which were erected or reconstructed, 32 are entirely of timber, 8 of timber ap-



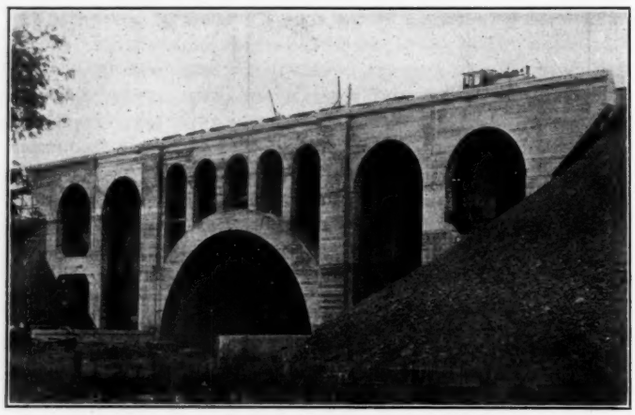
Portion of the Chicago, Milwaukee & St. Paul, Showing the Main Line in Iowa Which Has Just Been Double Tracked



A Special Type of Highway Under Crossing, Securing a Short Barrel by Use of High Parapet Wall

proaches and steel track spans on reinforced concrete bents, 5 of reinforced concrete, 2 of reinforced concrete approaches and steel track spans, and 1 entirely of steel.

For stream openings, steel girders on concrete piers, concrete trestles, concrete arches, steel viaducts and steel truss bridges were all used. Concrete piles were used in the bents of many concrete trestles. Reinforced concrete slab decks covered with ballast to form a solid roadbed were provided



A 60-ft. Reinforced Concrete Arch of Three Ribs, the Approach and Spandrel Arches being Designed as Beams

on 84.4 per cent. of all structures built on the line, requiring the placing of 20,326 lineal ft. of single track floor. Creosoted timber floors supporting ballasted tracks were laid on 140 ft. of single track amounting to 0.6 per cent. of all structures. The remaining 15 per cent. of the structures with a total single track floor length of 3,608 ft. were provided with open timber floors, the decision in all such cases being governed by the type of old single track structures or other local conditions.

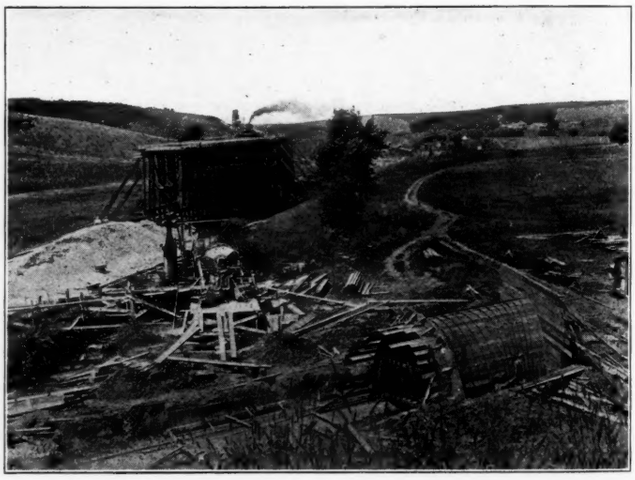
The standard concrete piles were octagonal in shape and were cast with a point for driving. They weighed about 230 lb. per lineal ft. and were made in lengths from 16 ft. to 35 ft. They were driven in some cases with jets and in other

A Special Type of Column Abutments Designed for a 125-ft. Double Track Truss Span

cases with drop and steam hammers. The piles were moulded at the company's pile plants at Tomah, Wis., and Van Horne, Iowa. The concrete slabs were built in slab yards located at convenient points near the work when they were to be placed in structures along the old line and were built in place on the structure when both tracks were on a new location.

Reinforced concrete column abutments were adopted quite generally where high abutments were necessary. A modified form of this abutment was used at the east end of the Manning viaduct, which consists of nine deck girder spans of varying lengths with a 125 ft. double track truss span at the east end skewed 30 deg. To have supported the truss span on this abutment in the standard manner on heavy concrete beams between the front columns would have required an excessively wide abutment and to avoid this the bridge seat was placed in front of and extending out past the front columns. For uniformity in appearance, this portion of the abutment was made like the pier on the opposite end of the span. The abutment is in reality a combination of a relatively heavy pier and a reinforced concrete trestle extending from the pier back through the 1½ : 1 slope to the top of the embankment.

As about 125 miles of the new line is on a new location which follows the old single track closely in places, a large number of crossings of the old line had to be made, involving the construction of large temporary structures. The most difficult problem of this kind was near Dedham on the fifth district, where the new line crosses the old seven times in



Typical Layout of Small Concrete Plant. Forms for Small Reinforced Concrete Arch in Foreground, Mixer Plant and Large Temporary Trestle Crossing of Old Line in Background

less than eight miles. All of these crossings were on very sharp angles ranging from 10 deg. 30 min. to 18 deg. 34 min. and in three cases where unusually long trestles were required, the cost approached $10,000 for each crossing.

DOUBLE TRACKING CEDAR RIVER BRIDGE

The five span deck truss bridge over the Cedar river just west of Marion was widened to carry a second track and the grade was raised 4 ft. at the west end and 2 ft. 6 in. at the east end. The work was handled practically without delay to traffic. Beginning at the east end, the old structure consisted of one 90 ft. deck girder span, five 160 ft. deck truss spans, one 90 ft. deck girder span and 896 ft. of pile trestle. The concrete piers supporting the old bridge were built about seven years ago and were still in good condition. By extending these piers and building new column abutments, the substructure was made to carry the double track structure, consisting of five 160 ft. truss spans and one 90 ft. girder span at the west end.

The change in grade was made by jacking up the ends of adjacent spans on one pier at a time in 8 in. lifts and cribbing under the shoes with 8 in. by 16 in. timbers. The process was repeated on consecutive piers across the bridge as many

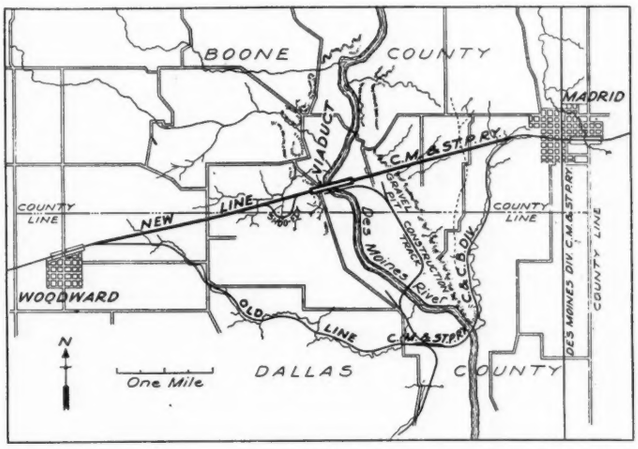
times as necessary to reach the desired elevation. When the spans had reached the proper grade, concrete blocks premoulded to the proper size were lowered from the deck of the bridge by a derrick car and were slid into place on the old piers. A single block was used under the two adjacent bearings.

The old trusses were spread to 28 ft. 8½ in., center to center, and a third truss erected between them. During this operation the old deck was supported on falsework. Pile bents driven on 16 ft. centers supported framed bents on which 8 in. by 16 in. timbers were wedged underneath the floor beams. When one of the old trusses was ready to move over, the floor beam connections were cut off and the bottom struts and lateral bracing were cut. The movement was made on four rails under each end of the truss, these rails being laid on the concrete blocks on the pier and supported between the blocks by timber cribbing. The movement was made with 35-ton jacks, the position of the trusses being controlled with tackles. The jacks used in moving the trusses were applied as low as possible on the truss shoes to reduce the overturning effect and the further precaution was taken of extending 12 in. by 12 in. timbers transversely from the old deck near each end of the old truss and about 2 in. above the top of the top chord, with wedges constantly in position between the top chord and these timber struts which could be driven up to control any unusual side movement during the transference of the truss. As soon as the trusses reached the new position, temporary struts were put in to secure them in place until the permanent lateral members could be erected.

This work was carried on by a gang of from 22 to 24 men, including three riveting gangs. A 22 horsepower gasolene engine compressor plant was installed at the site, serving three riveters and one rivet buster.

DES MOINES RIVER VIADUCT

The largest structure on the new line is the steel viaduct crossing the valley of the Des Moines river three miles west of Madrid. This is a double track structure with a length of 2,394 ft. 2 in. out to out of steel, and a maximum height of 130 ft. It consists of seventeen 40 ft. tower spans, twenty 70 ft. intermediate and end girder spans and two 156 ft. 6 in. riveted deck truss spans over the main river channel. The viaduct forms part of the new line between Madrid and Woodward, which reduces the distance 2.2 miles, and elimi-



Map Showing Location of Madrid-Woodward Cut-off on which New Viaduct is Located

nates 800 deg. of curvative and 200 ft. of rise and fall in a total distance of 5.5 miles.

Borings showed that from the west abutment up to and including Bent. No. 27, there was a thick bed of stiff yellow clay from 6 ft. to 10 ft. below the surface of the ground, which was good for an average pressure of over three tons per sq. ft. From Bent. No. 26 east, the surface layer consists of sand from 25 to 35 ft. thick, beneath which exists a stratum of hardpan. Piles were used to support these foundations.

Part of the Cedar River Bridge Showing Timber Bents Supporting Floor Beams During the Construction Work and Concrete Blocks on Piers used to Raise the Elevation

They were jetted on the average 26 ft. through the sand and driven from 12 ft. to 14 ft. into the hardpan. The average pile load was assumed as 18 tons.

The east abutment is located on a fill about 100 ft. high, and on account of the expense of an abutment built from the ground up and the uncertainty of its withstanding the earth pressure and settling of the fill, it was decided to use temporarily a small bank abutment until the fill had settled sufficiently to build more permanent work. The abutment rests on 60 ft. creosoted piles, carrying an average load of 12 tons. It consists of a thick reinforced concrete slab with timber backwall. Bars were provided for a permanent concrete backwall.

The concrete was of 1 : 3½ : 5 mix for the footings, and 1 : 3 : 4½ for the neatwork. The neatwork of all pedestals was poured in continuous runs, which necessitated working at night on a few of the largest pedestals. The largest run of 215 cu. yd. for the pedestals of Bent No. 24 was made in 24 hours, using one mixer. The total volume of concrete in the pedestals and abutments amounted to 11,850 cu. yd. The concrete in the abutments and pedestals situated on the slopes at the ends was mixed at the foot of the slopes and hoisted in concrete cars on an inclined track. The pedestals on the flat were placed by a stiff leg derrick.

The layout work was done by means of repeated horizontal

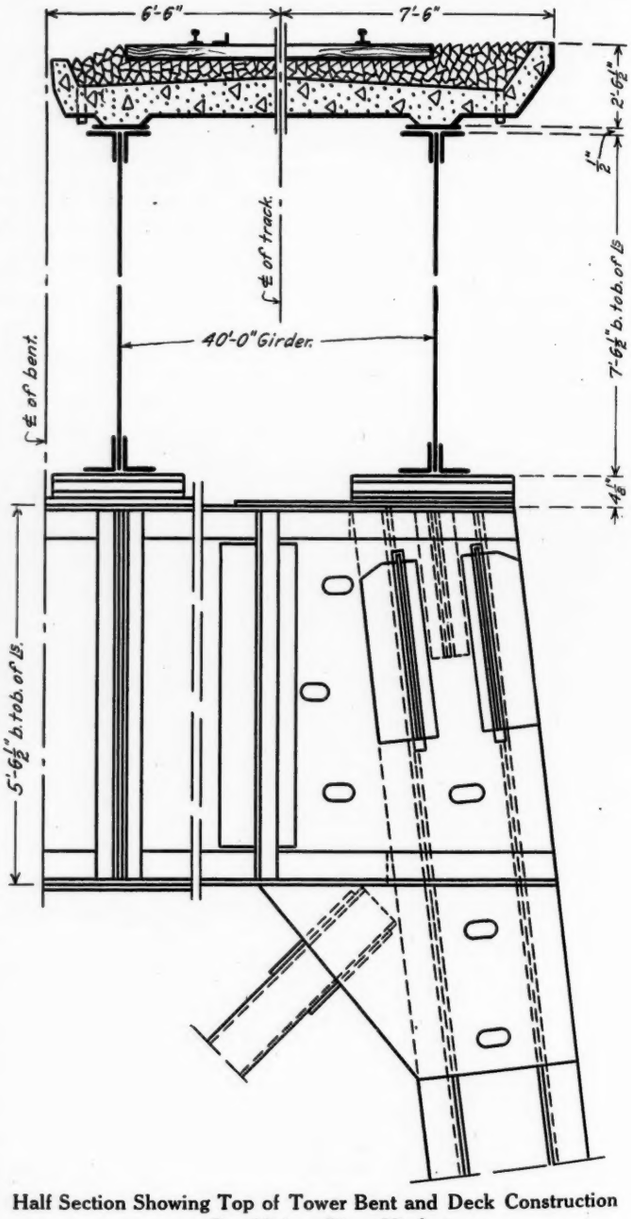
General View of the Des Moines River Viaduct

measurements with a 100 ft. steel tunnel tape. At each measurement point, an 8 in. diameter oak post 5 ft. long was set in the ground and a zinc plate tacked on top. Independent lines were run, establishing the 100 ft. stations, and the bents were checked from these points. On the slopes at the east and west ends, slope measurements were also taken as a check. Much of the measuring was done at night in order to secure the benefit of a more even temperature. The layouts provided for a normal temperature of 70 deg. Concrete bench marks extending 5 ft. into the ground were placed so that direct readings could be made from some bench mark to every pedestal.

The viaduct is designed for Cooper's E-55 loading. The deck girders are spaced 8 ft. center to center and are carried directly on top of the cross girders. They differ slightly from the ordinary type in that the web does not project above the top flange angles; cover plates being used instead, in order that the concrete deck slabs can bear centrally on the girders. The slabs are provided with bearing strips which rest on the cover plates between the inner line of rivets. At the ends of the 70 ft. girders, where the section does not require the cover plate, a plate of the same thickness as the cover plate, but of a width sufficient only to engage the rivets on the inner line in the flange angles, was used to keep the bearing surface of the slabs at the same elevation.

The cross girders are box girders. At the ends the webs are shop spliced to the gusset plates, which are shop riveted to the outstanding legs of the column angles, the columns being spliced below the gusset plates. These gusset plates are also slotted on one side of the cross girder to permit the gussets for the longitudinal bracing to be entered and riveted to the column webs and angles. This construction is easily erected and presents an excellent appearance.

The longitudinal and transverse bracing is a double system capable of taking both tension and compression, and is made up of channels turned in and laced. One diagonal of the longitudinal bracing is in all cases carried through the intersection as a single member, while the other one is broken. This is done to provide an additional safety factor against the sagging of these members. The tendency to sag is



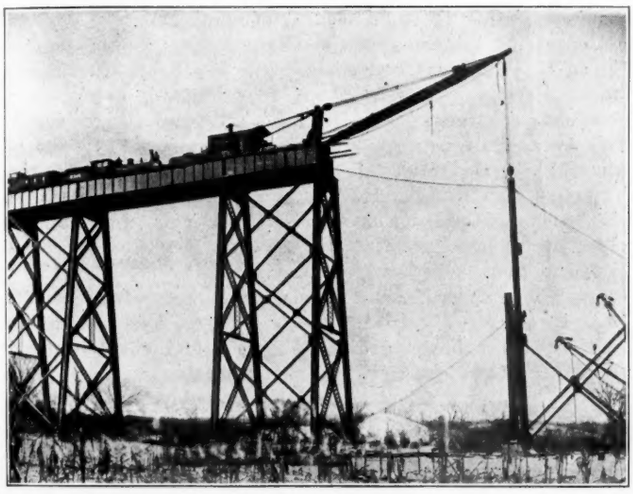
Half Section Showing Top of Tower Bent and Deck Construction on Des Moines River Viaduct

greatly increased by the fact that the longitudinal braces do not stand in a vertical plane, but are in the same plane as the columns of the towers. In the transverse system, all the diagonals were broken at intersection points, the tendency to sag not being so great, as the bracing lies in a vertical plane, and the method used made the erection somewhat simpler. The double system of bracing was chosen because of the increased rigidity; rigidity as well as ultimate strength being an important consideration in the design of high trestles. At the top the towers are braced in a horizontal plane by

cross frames composed of two 6 in. by 4 in. by 5/8 in. angles riveted back to back. These laterals connect to large lateral plates riveted to the tops of the columns and cross girders, and are also riveted to the lower flange of the inside tower girders.

The columns of the river bents are cut off at the proper elevation to support the shoes of the truss spans which are placed directly on top of the columns. A 2 in. plate is used under the bearings to secure a more equal distribution of the load over the column section. Struts are substituted for the cross girders in these bents. On account of the heavy loads, it was necessary to make the columns of the rocker bent between the two channel truss spans much heavier than those in the towers. At the base the columns rest on cast steel rocker shoes connected by a 14 in. diameter pin. The load is further distributed by means of an I-beam grillage.

The west truss has a fixed bearing on the rocker bent while



Erection of Des Moines River Viaduct by a 50-ton Derrick Car on the Deck of the Structure and a Mule Traveler on the Ground

the east truss is provided with segmental rollers for expansion. By this arrangement the traction forces in the truss spans are equally divided between the two river towers, whereas had the expansion been placed at either of the river towers, the bracing in the opposite river tower must necessarily have been very heavy. Large links having one round hole for the fixed end and one slotted hole for the expansion end engage the pins on each side of the shoes and limit the movement due to expansion and contraction. The links are provided as an extra precaution in case of the settlement of either shore tower, so that the spans would still be held at the rocker bent.

On the channel spans the tops of the floor beams are flush with the bottom of the top chord, the stringers being placed on top of the floor beams, and being the same distance center to center as the girders on the trestle. This arrangement allows the floor to be uniform from end to end of the viaduct. It also prevents the projecting ends of the floor beams from marring the appearance of the structure.

The entire viaduct is provided with a reinforced concrete deck slab ballast floor. The outer edge of slabs is brought up to the elevation of the base of rail to give the deck a more substantial appearance. Refuge platforms formed by two special slabs having the outside parapet extended are provided about every 150 ft. Open holes are provided in the outside parapet wall of alternate slabs, and through these are bolted the castings to support the hand railing stanchions. A 2 in. diameter pipe railing was used. This is primarily for the safeguarding of the section men, but it also gives a feeling of security to see a concrete parapet surmounted by a railing. Guard rails are provided for both the inside and outside rails.

In common with all viaducts recently built by this company, this structure is provided with hand holes and ladder bolts to make climbing easier and safer, and with open holes for hanging staging for purposes of erection, inspection and painting. Each column in the viaduct has hand holes in all transverse gusset plates that are 3 ft. or more high. At the top of each column two horizontal ladder bolts are passed through the outstanding legs of the flange angles on the outer face of the column and the ladder is continued up the sides of the girders by passing ladder bolts through the outstanding legs of two adjacent stiffener angles.

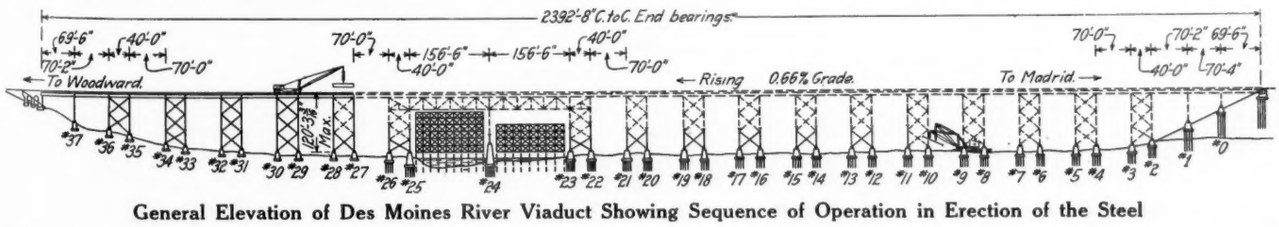
ERECTION OF DES MOINES RIVER VIADUCT

The erection was begun and carried forward from the west end, as the fill at the east end was not finished until after the completion of the steel work. A temporary "shoo-fly" track connected the main line with the west end of the bridge and provided a storage yard for materials. All material, except the lower stories and the castings of the towers was erected from the track level with a 50-ton derrick car, equipped with an 80 ft. boom and a 50 horsepower engine. The procedure found most satisfactory was to erect each bent complete, place the girders and laterals and lastly to place the longitudinal tower bracing. Temporary ties and rails were laid as the work advanced. The material to be erected was brought out on flat cars as far as possible on the track opposite the derrick car, and was then carried to position, suspended from the boom. The bracing and laterals were handled with runner lines; the girders were handled with the load line. The maximum stresses produced in the derrick were caused when placing the 18-ton cross girders with the boom reaching across a 70 ft. span, and swinging in a distance of 6 ft. 8 in. from the center line of derrick car track. The following table shows the shipping weights of some heavy members handled:

Cross girder for single bents	36,300 lb.
70 ft. girder span	36,500 lb.
Middle section of column rocker bent	72,700 lb.
Long bottom chord member	58,000 lb.

All riveting was done with pneumatic hammers with a pressure of about 105 lb. The compressor was located on the west bank of the river, and the power supplied by a 40 horsepower gasolene engine. About 23 field rivets per ton of metal were required for the trestle spans, while for the truss spans this number increased to 30. The riveting was carried on continually from the time the erection started, the greatest number driven in one day being about 1,900 with four gangs working.

From Bent No. 32 to Bent No. 4, where the comparatively level nature of the ground made it possible, the lower stories



General Elevation of Des Moines River Viaduct Showing Sequence of Operation in Erection of the Steel

of the towers were erected by means of a mule traveler equipped with two 60 ft. booms and two double cylinder engines with double friction drums and four independent winch heads. This traveler ran on an 18 ft. gage track, laid along the center line of the viaduct. The material erected by the traveler was delivered on the flat east of the river and was brought out for erection on a low level temporary construction track, parallel to and 60 ft. south of the center line of the viaduct.

The truss spans were erected on a three-story falsework trestle, supported on a pile foundation. Each story of the falsework was framed in units. The units for the two lower stories of the bents were framed on the pile caps and lifted into place by the mule traveler. The units for the upper story were framed at the west end of the bridge and together with stringers and blocking were placed in position by the derrick car as the work advanced. After the west truss had been swung, the stringers and units in the upper story of the falsework were taken down and again used under the east truss.

The most difficult problem in connection with the erection of the steel was the handling of the 72,700 lb. middle sections of the rocker bents. In order to do this, it was necessary to shorten the boom of the derrick car to 42 ft. The column sections were unloaded from the low level construction track previously referred to, placed on carriages, and run out on a trestle parallel to and 9 ft. west of the center line of the rocker bent. As nine strands of ¾ in. wire cable were required for the load line of the derrick, it was impossible to get sufficient line on the drum to reach the members 115 ft. below base of rail. A 70 ft. loop of 10 strands of ⅝ in. diameter cable was provided, passing over a 50-ton hook on the end of the load line and through an erection casting at the bottom. This casting when lashed to the column section, prevented the lines from cutting and at the same time allowed the member to be swung to the correct batter. To guard against any outswing while lifting these heavy members, the derrick car track was temporarily curved out so that the end of the boom was nearly over the load with the boom on the center line of the car.

The maximum tonnage erected in one day with both derrick car and mule traveler amounted to approximately 200 tons. It is to the credit of those in charge that not a single fatality nor serious accident occurred during the work. Ground was broken July 10, 1912, and the last span of steel was completed July 12, 1913.

The entire improvement work on the Chicago & Council Bluffs division was handled under the direction of C. F. Loweth, chief engineer, and A. G. Holt, assistant chief engineer. W. E. Wood is the district engineer, located in Chicago, E. L. Sinclair, the assistant district engineer at Marion, and L. D. Hadwen, engineer of masonry construction. The bridge designs were made under the direction of J. H. Prior, formerly engineer of design. E. H. Howell was general superintendent of the construction of the Des Moines river viaduct.

A CORRECTION

The captions under the two cuts accompanying the article entitled "New Haven Improves Method of Electric Operation" on pages 988 and 989 in the issue of last week were inadvertently transposed. The error, however, is so evident that it undoubtedly caused little confusion to our readers.

Improved Trans-Siberian Service.—A special commission of the Russian Department of Communications has recommended the establishment of a through fast train between Moscow and Vladivostok. At present passengers have to change cars at Irkutsk.

THE ECONOMIC TRANSITION*

By Logan G. McPherson
Lecturer on Transportation at Johns Hopkins University

The great problems now claiming public attention are essentially economic. They deal, almost entirely, with material welfare. That which is indefinitely designated as the transportation problem is one phase of the general problem. Before there can be intelligent discussion of the transportation problem, it is necessary to consider the broad economic background.

Much of the controversy that attends the prevailing social discontent is due to conflicting conceptions of the order of things.

Throughout two thousand years there has been given diffusion to the concept that the natural state of man is that of peace and good will; that conflict is evil; that strife, especially that prompted by the desire for power and for money, has come into the world because of man's fall.

About the middle of the nineteenth century impetus was given to a different concept, now widely accepted. This is that all progress has been due to conflict, is the result of contending forces. It is certain that political government has been evolved through strife. The instincts of primeval man, transmuted into desire for power and possession, have impelled men to fight and the powerful have conquered. It is through struggle for existence and the survival of the fittest that the political governments of today have been evolved. But the ferocity of the elemental struggle has, from time to time, been modified as the human mind has realized the devastating effects of strife. Ruthless pillage and the wanton taking of life have become abhorrent and have been succeeded by laws conducing to the general good.

It is readily perceivable that economic development is proceeding in a manner analogous to that of political development. As era of war has been followed by era of peace, the struggle has continued not on the field of battle, but in the field of industry and commerce. This struggle we know as "competition." As the stronger, the more energetic, alert and enduring, triumph in war, so do the same qualities lead to success in industry and commerce. Competition has been warfare. Business, during the regime of competition, has been organized warfare. Cunning and strategy have had their part in the achievement of victory.

Conquerers in the field of war brought people together in political units of larger size and of greater stability, and so laid the foundation for a higher political development. So, too, it has been men, prescient and able to grasp the significance of events, who have forged the links of industrial and commercial organization throughout the world. Their initiative and their energy have lifted human life to higher levels. In the domain of politics there has been struggle between those who sought power for their own selfish ends, and those who have demanded that political power be used for the whole people, that the administrators be servants and not rulers. In the domain of economics the struggle is between the many who hold that the leaders in finance and industry are their oppressors, and who demand what they regard as a more equal distribution of the fruits of industry and commerce, and those of the leaders who contend that the demands of the many are becoming so onerous as to interfere not only with the beneficial distribution of wealth, but with its very production. In the unrest of recent years many have held that the general welfare would be secured if the financial and industrial leaders were reduced to the common level and the organizations they have brought about dissolved. On the other hand, there are those who hold that such organizations are a natural and inevitable step in industrial evolution. They hold that, instead of being destroyed,

*Abstract of a lecture delivered at Johns Hopkins University, Baltimore, Md., May 1, 1914.

the organizations should be purged of their evils, curbed and guided to that efficiency that inures to the common good.

The question, therefore, is of the method by which and the extent to which the procedure of those who have developed the industrial and commercial organizations of today shall be restrained by law, and the extent to which the form of these organizations shall be modified by law. The feeling that every man was entitled to security in the possession of that which belonged to him led to laws establishing and defining the rights of property. Are other laws now necessary to safeguard the American citizen as an individual or the American nation as a whole in its economic development?

It was held, in the United States from the beginning of its history, that business enterprise should be unfettered. It was held that every man is entitled to have and to hold that gained by the work of his hand or the effort of his brain. As a preventive of unjust exactions, of the evils of exorbitant prices, there was reliance upon competition. There was virtual committal to the belief that in the field of business there should be the struggle for existence and the survival of the fittest, although those phrases had not then been formulated. If a man attained material success, prosperity was his; if a man suffered material loss, deprivation was his. If a man did not succeed in one vocation, he could enter upon another at his choice. If it was his lot to fall by the wayside, so he fell. This was individualism. That the belief in individualism has waned, everybody knows. The mill in which there are gathered many workers attending machines driven by one steam engine has displaced the scattered artisans working each by himself, with his own tools in his separate house or shop. The building of a railroad, of roadbed and track, of locomotives and cars has been substituted in greater part for the work of the few farmers or the few laborers in building and repairing the high road, in making a wagon and keeping it in repair, in the feeding and harnessing of a team of horses.

The division and co-ordination of labor means that the many must work under the direction of the few. These relatively few become the agencies through which the greater number find employment, and through which the wages of this greater number are paid. All this means an advance in collectivism.

With increasing demand for products of all kinds, men of shrewdness to see and ability to grasp larger opportunities enlisted to a greater extent the co-operation of others by the payment of wages or the forming of partnerships. When the field of operation so expands as to necessitate plant and appliances more extensive than can be provided except by contributions from the accumulations of a considerable number of persons, there arises a new form of organization, the corporation. Development in the organization of industry and commerce, which led to the corporation, has been beneficial to the people as a whole. Interwoven throughout this development has been the working of competition, a system beneficial to the community as a whole as far as it enforces the element of thrift in industrial processes. It is beneficial when it forces cessation of production that is unable to withstand the pressure of competition from localities more favorably conditioned. It is injurious when it compels producers to dispose of their products at unremunerative rates, and when producers, striving to dispose of the greatest possible output, place upon the market a supply exceeding a natural and wholesome demand. It is injurious when strife for the disposal of product becomes so fierce that the energies of producers are absorbed in fighting competition to the neglect of the orderly processes of production; when it leads to misrepresentation of quality, and when, in desire to produce cheaply, it leads to adulteration of material and to inferior workmanship. It is injurious when it leads to wage reduction below the rate adequate for the support of the workman and his family.

Excesses in competition are most prevalent during periods of industrial depression. They were notably conspicuous during the years immediately following the panic of 1893. Reaction from disastrous competition led to the formation of what were at first called "trusts," but which later became the amalgamation of corporations in the same line of activity, into greater corporations. With the formation of these greater corporations, the pendulum swung from the evils of unrestrained competition to the evils of unrestrained combination. Instead of devoting their energies toward economies in production and distribution, the managers of some of these huge organizations sought to secure monopoly by stifling competition through predatory methods, by raising prices to the highest level that the unprecedented demand of the period would permit and, at the same time, hammering down the prices of raw materials, while grossly inflating the capitalization on which they sought to pay returns. There are many great corporations that have not resorted to such tactics, but enough have done so to bring about a violent reaction against all, and particularly against a few of the more conspicuous.

A notable effect of combination on large scale has been the strengthening of another kind of combination which has become, perhaps, the more powerful. This is trade unionism, which has persistently fought for higher wages. shorter hours, and easier conditions, regardless of consequences to the vastly greater number not enrolled in labor organizations.

Under unrestrained competition, the weaker are left behind and, when the struggle becomes intense, many fall by the wayside. Under unrestrained combination, it is the strong, the shrewd and the swift who ultimately come into control of business enterprises. Whether there is unrestrained competition or unrestrained combination, it is the really efficient in the long run who prosper and the weak who do not. Unrestrained competition means the ruthless denudation of forests by those whose only thought is immediate profit; the stripping of superficial layers, quickly and cheaply taken, from beds of coal; the rushing of underfed livestock to market; inefficient tillage and soil exhaustion. Unrestrained combination means the seizure to the extent that may be possible, by the strong, the shrewd, and the farsighted, of the sources of supply of materials of universal need, of fields of ore and coal, of vast areas of land, of dock and harbor frontage. Yet, while they may offer great resistance to competition, they cannot stifle it unless their facilities are employed in production at prices so low as effectually to discourage competition. This certainly is the status of the railways today. As with all things else, industrial competition, when carried to its extreme, meets opposing forces that bring reaction, forces that tend toward combination. So, too, does combination, when carried too far, meet resistance and bring reaction.

Before there is radical change in our laws, change designed to suppress combination and to compel competition, there should be clear perception of the economic status desired and desirable. We must bear in mind the fact that business tends more and more to become an organic whole, that it tends more and more to become an instrument of social service. The manifold division of labor means a multiplied exchange of the products of labor. When the producer supplies what the consumer wants, there is fuller satisfaction of the needs of both buyer and seller. On its social side, business means the specialization of production and the exchange of products. The work of the individual, through the forces bearing upon all individuals, becomes the work of each in behalf of all. The business man, seeking his own ends, becomes part of an organic whole through which are served the needs of all.

In no other age and in no other country has so much been done to meet the needs and the wants of the people as is done in the United States at the present time. Upon no other group

of our citizens does there rest a greater responsibility than that resting upon the leaders and the managers of our great institutions of production, distribution, and finance, and by no other group is the sense of responsibility more clearly realized.

There can be no effective denial of the fact that the boards of directors of the banks throughout this country are, as a rule, composed of men of probity and judgment, men esteemed as good citizens; or of the fact that the associations of bankers and bank clerks through discussion and the joint adoption of better methods have vastly improved and safeguarded banking procedure.

There can be no effective denial of the fact that the boards of directors of the railroad companies are in greater and greater measure coming to be composed of citizens of great ability and high repute. The officers of the various railways are allied in associations which discuss every phase of operation and administration from the most durable paint to be used on freight cars to the statistical methods best adapted to exhibit the comparative efficiency of the management of every division and subdivision.

From the boards of directors of the great industrial corporations, the speculative promoter and the financial buccaneer are being eliminated. Those engaged in nearly every line of industry and commerce are banded in associations which meet periodically for the discussion of subjects of mutual interest, to consider measures for bettering the practice and improving the status of the industry. The leading manufacturers and merchants of every community are in the forefront of every movement for its development. In chambers of commerce and similar associations the affairs of the community are openly discussed.

The work of these agencies that tend toward industrial, commercial and civic advancement proceeds in the main independently of the work of the agencies charged with the political government. Such effort is of men who are immediately engaged in activities which tend to make two blades of grass grow where but one grew before.

With all their excellence of accomplishment it cannot be claimed that these industrial and commercial organizations and associations eliminate the self-seeking of their members, but they do focus that self-seeking so that it can be seen of all men, and the activity which springs from enlightened self-interest be distinguished from that prompted by rapacity.

That the social status is in transition is admitted. Indeed, there has been transformation in the course of a generation. That the change is making for the ultimate good is to be hoped, but a false step in the treatment of the serious economic problems that confront the nation today may not only arrest development, but set back the hands of progress.

PROMOTIONS ON THE CANADIAN PACIFIC

A plan for keeping systematic records of the character and ability of individual employees, recently adopted on the Western Lines of the Canadian Pacific, was noticed in the *Railway Age Gazette*, April 10. The object of the plan is to enable officers to act more intelligently in making promotions. In a letter from an officer of the road we have the following additional particulars:

"The Canadian Pacific, for operating purposes, is divided into two large units: one taking in all lines east of the head of Lake Superior and the other all lines west thereof. The lines west of Lake Superior, comprising over 7,000 miles, are divided into four grand divisions, each presided over by a general superintendent, who is assisted by a car service agent, a master mechanic and a division engineer. Each grand division is divided into districts, each district being presided over by a superintendent. There are three terminal superintendents and fourteen district superintendents, the mileage they control varying according to the density of traffic and the physical characteristics of the road. Each superintendent has one or more trainmasters, a chief train despatcher, a resident engineer, a district master mechanic, a bridge and building master, and several roadmasters. A roadmaster has control of from 130 to 150 miles of track. The organization is purely divisional.

"The new reports are to be made semi-annually and the first will be next June. Several months ago every superintendent was written to and directed to send in the names of five men whom he considered the best in certain grades of service—agents, train despatchers, section foremen, bridge and building foremen, conductors, engineers, locomotive foremen, etc.—under the following headings: Loyalty, ability, education, appearance and disposition, and to give his opinion concerning their fitness for promotion and in what line. In this way something over 400 names were sent in, and from these names the chief clerk, who looks after the staff records, made up a statement to which he added the age and length of service of each employee. The chief of the staff records was then directed to write to each of the employees mentioned, explaining what had been done, and stating that vacancies on a growing system had often to be filled on very short notice and that he had been instructed to compile for the management a list of employees who were desirous of promotion; he asked each to write him fully saying whether they desired promotion and in what branch of the service they thought their abilities would secure recognition. They were asked to write very freely about this and assured that anything they might say would be received sympathetically.

"The replies received seem to indicate that the majority of the men had thought that their chances of promotion were not very great, but that there was a latent ambition which the new scheme was quickening into life. After the replies were received a list of the men on each of the grand divisions was made up and sent to the general superintendent, and he was advised to take the earliest possible opportunity of seeing these men and sending in his opinion of them. At the same time each general superintendent was instructed that from now on when a man was wanted for chief clerk, storekeeper, locomotive foreman, car foreman, district master mechanic, trainmaster, roadmaster, despatcher, chief train despatchers, etc., he was to ask the chief of the staff records for a list of the men whom he had on record as being desirous of promotion to these positions, in order that he might go over the list, make inquiries, and pick out the most suitable men. This has only been in force a couple of months, but two trainmasters, two chief train despatchers and three roadmasters already have been appointed in this way. For the first appointment a locomotive engineer at Revelstoke was made trainmaster at Kerrobert. Revelstoke is on the first district of the British Columbia division, while Kerrobert is on the fourth district of the Saskatchewan division. The next vacancy for trainmaster was at Saskatoon, on the third district of the Saskatchewan division, and the man for that position was found in a conductor on the second district of the Alberta division. The first vacancy for chief train despatcher occurred at North Bend, on the second district of the British Columbia division, and the man promoted to fill the position was a despatcher on the first district of the Alberta division. The next chief train despatcher was required on the second district of the Alberta division and a train despatcher from the third district of the British Columbia division was selected, and so on with the roadmasters.

"The engineer who was picked for trainmaster at Kerrobert is a young man of good family with a college education, who, desiring a railroad career, began as a wiper and worked up to the position of locomotive engineer. He has studied to fit himself for an official position. The second trainmaster was selected from a conductor who had had a good, common school education, began service as an operator and worked up to the position of train despatcher. In order to fit himself he dropped back to switchman of his own accord,

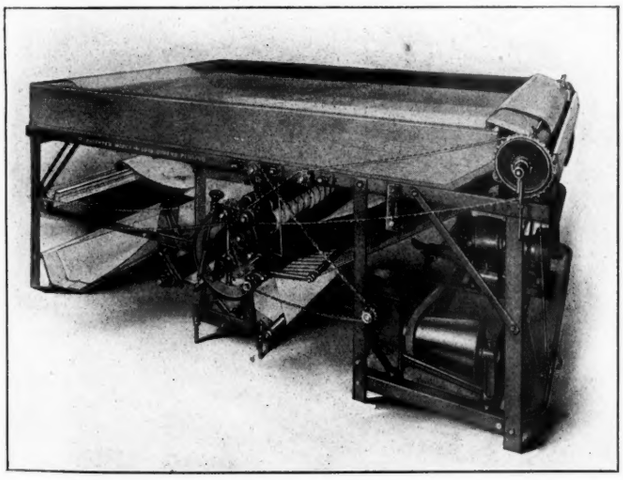
worked up from that to brakeman and then to freight conductor.

"There are many thousand men on the Canadian Pacific, and under the old system vacancies occurring on a superintendent's district were ordinarily filled from men on that district, never outside the grand division, but under the method now adopted, it will be practicable to pick out the best and the most ambitious men from any part of the system. The officers and employees will thus obtain a more varied experience, for conditions on different divisions are in many respects different, and, besides, it will develop an *esprit de corps* and stimulate ambition among men, who ordinarily, in railroad service, on account of the great number of employees, are prone to feel that promotion, like kissing, goes by favor, rather than altogether on merit."

NEW BLUE PRINT MACHINES

The Revolute washing, drying and ironing machine, which is shown in the illustrations, is the result of long study and experimenting to produce a universal machine that will handle not only continuous blue print rolls, but separately cut sheets. The inconvenience of having to keep a machine of this sort continually "threaded" has been borne in mind, and in this design this objectionable feature has been eliminated.

In order to insure the prints being thoroughly washed, which is necessary in order that the chemical reaction may be complete and the prints permanent, a tank has been provided in which the prints may be soaked for any desired length of time. A sufficient quantity may be put into the tank at one time so that some prints may always be ready for drying. When long rolls are being washed they are run through the tank continuously. The surface water is removed mechanically before attempting to dry the print, and the good quality of work is largely due to the uniformity of the moisture in the print when it goes to the

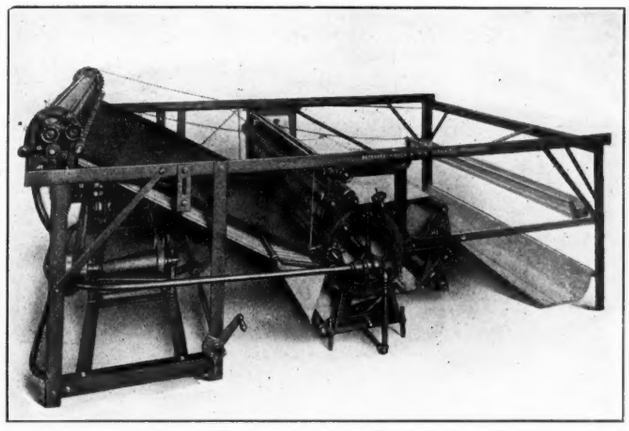


New Machine for Washing, Ironing and Drying Blue Prints

hot drum, and the fact that it is held securely against the hot drum while being dried. The surface of this drum is made absolutely true, insuring the prints being ironed out perfectly flat when delivered from the machine, a feature that is especially valuable in drying vandyke negatives.

The four principal features of the washer and drier are: A tank in which the prints are washed; a wringer which removes the surface water; a hot drum for drying and ironing, and an automatic winding up device for the long prints as they come from the drier. In the operation of the machine, the operator, standing in front of the wringer, reaches over it to the tank, lifts the print by the edge, wetting the finger tips only, and lays it on the upper roller of the wringer, which is a 4-in. brass tube accurately ground. The lower roller is a steel shaft covered with felt, which bears against the brass tube, and removes the surface water from the print, at the same time allowing the print always to adhere to the brass roller.

A set of stripping fingers removes the print from the brass roller and lays it on a set of traveling belts, which carry it to the hot drum, where it passes under a wide canvas belt to the surface of an 8-in. steel drum, accurately ground, and heated by either gas, steam or electricity. During three-quarters of a revolution the paper is held against the drum and dried and ironed. It is then stripped from the drum and deposited in a receiving trough at the end of the machine, or is rolled up in the automatic winding up device if it is a long print. The tem-



Blue Print Washing Machine with Tank Removed

perature of the drum and the speed of travel may be varied to correspond with the weight of the paper which is being dried.

The machine is driven by a motor through a variable speed gear, consisting of a belt running on two cones, driving the machine through a worm gear. The speed can be instantly changed by moving the lever. All rollers in the machine carrying any appreciable load are mounted on ball bearings. A foot treadle throws the wringer out of gear, and it may then be turned either way by hand in case a print should be started crooked.

This machine is manufactured by the Revolute Machine Company, 417 East Ninety-third street, New York, and will run as a unit with any of that company's blue printers, for continuous printing, washing, drying and ironing. However, this is not recommended, as it is unlikely that the most economical speed of the blue print machine would be also the most economical speed of the washer and drier.

The same company has recently put on the market a new small, compact machine called the "Half Moon" continuous. It is built on the same general principle as the Everett-McAdam machine previously described in these columns, and consists in principle of a revolving glass cylinder with the source of light inside, consisting of two mercury vapor lamps, the cylinder rotating in a series of narrow belts.

The blue print paper passes between the belts and the glass, with the tracing next to the glass, and the printing is done while the paper revolves with the cylinder through three-quarters of a revolution. The machine will print 32 in. wide and is designed for offices where the demand for blue prints is not large, and yet where the very great convenience of having a machine which is always ready to make a print is appreciated. It is simply necessary to turn a switch and tilt the upper part of the machine, which automatically lights the lamps. The machine is driven by an electric motor through a variable gear, which allows the machine to be run at any pre-determined speed.

THE G. E. VACUUM LIGHTNING ARRESTER

The illustrations show the General Electric Company's latest type of vacuum lightning arrester. These arresters are the result of several years' work on the low voltage arrester problem, during which time several types of vacuum lightning arresters were developed and later discarded for improved designs.

In Fig. 2 the copper tube is partly cut away to show the internal construction. The disk and lining of the vacuum chamber are made of a metal with which permanent short circuits are

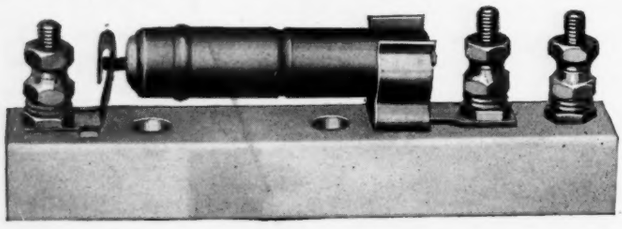


Fig. 1

not formed across the gap; and by the use of a strong metal tube the arrester is made capable of withstanding much heavier discharges than the earlier glass bulb types.

By the use of a gap in a vacuum a low discharge point, averaging 425 volts D. C. is made possible; and with the use of the heavy metal tube this discharge value remains constant over continued periods of severe service.

Two styles of bases are made—one with three terminals, as

Fig. 2

shown in Fig. 1, which provides for through wiring, and the other with only two terminals, one for tapping off the line and the other for the ground connection. The General Electric Company has also developed a new testing set for determining the voltage at which the arrester will discharge.

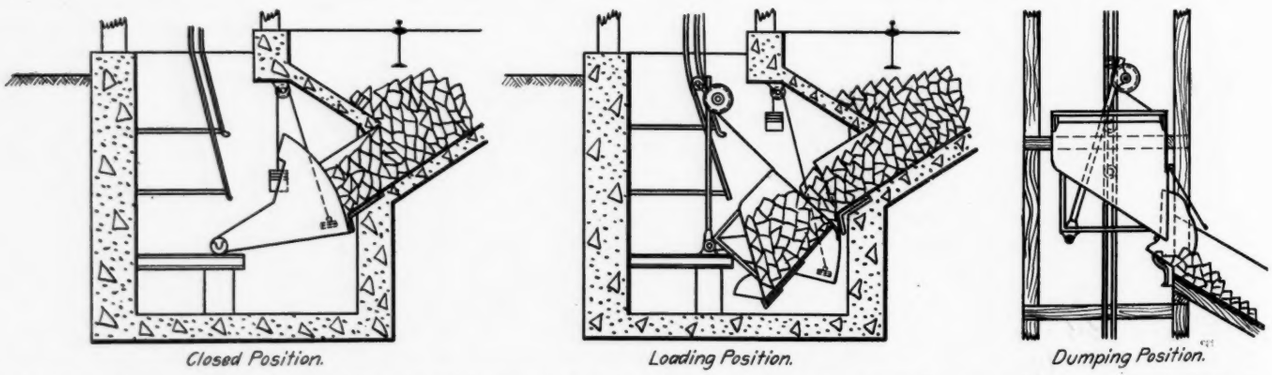
THE SCHRAEDER PIT LOADER FOR LOCOMOTIVE COALING STATIONS

An improved pit loader has just been developed for use with the balanced bucket type of coaling station. This new loader eliminates all measuring devices, making the bucket itself measure the coal as it falls through a spout from the hopper. As shown in the accompanying illustration, the chute is closed by a hinged gate, to which is attached a counterweight holding it normally closed. When the bucket comes down into the pit to load it pushes down the gate and tips under the chute. The coal flows into the bucket until it chokes, and as soon as the cable reverses, pulling up the bucket, the counterweight on the gate automatically pulls it up, closing the end of the chute again. The standard automatic reversing hoist, driven either by electricity, gasolene or steam, is used with this plant. The bucket is so designed that it can be operated in either direction by simply reversing it in the guides. The designs have been completed for 1, 1½ and 2 ton buckets, and a 2½-ton outfit will be put out in the near future. Only two types of hoists will be used, one designed for the 1½-ton and one for the 2½-ton bucket. The smaller size buckets will be used with the hoist of the next larger capacity.

The elimination of measuring devices allows a much shallower pit to be used, the maximum depth for a 2-ton outfit being 12 ft. The advantage of such a shallow pit is often important, as quicksand is frequently encountered at about the 12-ft. depth. This saving in the pit depth effects a saving of about 15 ft. in cable travel and allows approximately 15 tons per hour more coal to be hoisted with a 2½-ton bucket for the same cable travel that is possible with an outfit using a measuring device.

This patented loader is controlled by Gurley & Schraeder, consulting engineers, Chicago.

Sporting Chances in London Travel.—All the joys of city rapid transit are not confined to American cities alone. The following, taken from a letter to the *Times*, of London, shows that to be beyond dispute. It relates to the Central London, an underground railway: "The service used to be content to carry passengers to their destinations in an ordinary humdrum way, mostly seated, it is true, but with no fun for their money. Now, any morning in these parts you may see gents, presumably on their way to play marbles in the city, gleefully betting on the platform as to whether the next train will stop or run through. Having at last captured a tired train there is the further sporting chance as to whether it will stop at or pass the station at which they had thought to alight. In order not to kill joy the company carefully refrains from placing any indicator on the car, as is done on less sporting lines, while the guard, busy in harvesting and flattening out for further circulation derelict newspapers, takes good care not to give the show away. In heavy storms, or if for other reason an especially crowded time occur, the management display a pawky humor in reducing the cars to three or even two; any Sunday morning much amusement may be cheaply gained by observing bevies of ladies in all their bravery, armed with prayer-books, relegated to the smoking car, two to each strap, apparently using devotional language. Then, again, what more mirth compelling than to watch the guard at some wayside station, say the Bank, sternly admonishing his flattened sardines to 'hurry up' out of the one practicable door of an end car before his train speeds on its way to some really busy place. 'In case of fire,' well—'turn out the guard.'"



Three Positions of the Schraeder Pit Loader Showing Method of Loading Bucket Without Measuring Device and Method Used for Dumping Bucket

General News Department

The board of arbitration appointed to arbitrate the controversy between the New York, Chicago & St. Louis and the telegraph operators will begin hearings at Chicago on May 10.

J. D. M. Hamilton, claims attorney of the Atchison, Topeka & Santa Fe, addressed students of the University of Illinois at Urbana, Ill., on April 30 on railway accidents and the safety-first campaign.

The Louisville & Nashville has appointed a man to the position of entomologist and horticulturist in the person of E. A. Miller, heretofore assistant entomologist in the department of agriculture of the state of Texas. Mr. Miller's office will be at Etowah, Tenn.

Press despatches of May 3 report the destruction by a flood of the new $125,000 steel bridge of the Chicago, Rock Island & Pacific over the Canadian river at Bridgeport, Oklahoma. Six men were on the bridge when it fell, three of whom are said to have been lost.

On Friday, May 1, the radio telegraph operators of the Delaware, Lackawanna & Western carried on telephone conversation, without wires, between Scranton and a car on an express train traveling between Scranton and Stroudsburg, a distance of about 50 miles.

The Pennsylvania has notified the city of Baltimore that the proposed extensive improvements planned for that city, including freight houses, yards, tracks, bridges, etc., involving expenditures of ten to twelve million dollars, will have to be postponed, because of lack of money.

The Pennsylvania Railroad announces that hereafter no liquors will be sold at the company's restaurant in the station at Pittsburgh. Another order issued by the Pennsylvania requires station agents in certain counties in Maryland to keep a record, open to the public, showing the deliveries of intoxicating liquors at their respective stations.

August B. Miller, the locomotive engineer at fault in the North Haven collision, last September, and tried on a charge of involuntary manslaughter, was acquitted by a jury in the Superior Court at New Haven, May 6. The jury deliberated five hours. Miller, with Flagman Murray and Conductor Adams, were arrested on bench warrants. Murray recently pleaded guilty and was sentenced to a year in jail, but the sentence was suspended. Adams is yet to be tried.

Railways operating through Iowa refuse to come under the Iowa employers' liability and workmen's compensation law. They have refused to make reports to the state labor commissioner on accidents which occurred through the operation of their lines, asserting that they are under the federal liability law and that their employees cannot claim protection under the Iowa statute. The roads are already reporting accidents occurring in the state to the state railroad commission, and this they claim to be sufficient.

The new Maryland law requiring that signalmen, etc., who send or receive train orders, shall have two days of 24 hours each off every month, with pay, is chapter 26, and it was approved March 4. Of the numerous bills affecting railroads which were before the last Maryland legislature, this appears to be the only important one which became a law. In emergencies, a signalman may work regardless of the law, and when so working, must be paid regular compensation. The penalty for violation of the law is not less than $100, one-half of the sum recovered being payable to the informer.

Motion pictures were a prominent feature of the last meeting of the Safety-First Committee of the New York Division of the Pennsylvania, which was held at Trenton, N. J., on Friday evening, April 24. The meeting was held in a large theater and was attended by 2,000 persons. The motion pictures were from films made immediately after a number of important passenger train wrecks during the past year or two, one of them showing scenes in Germany. Another motion picture gave lessons in first aid to the injured, and the final one was a stirring dramatic play entitled "The Red Signal."

George Oldfield, station agent of the New York, New Haven & Hartford, at Stockbridge, Mass., was the recipient last Sunday of a gift of a large silver loving cup and a purse of $900, to be used for a vacation trip to England. Mr. Oldfield has been agent at Stockbridge 25 years and this testimonial, marking the anniversary, came from about 200 of his friends, who invited him to a meeting in a hall. Many of these friends are New York City people who spend their summers in Stockbridge. Ralph Heath, who recently retired from the position of assistant agent, to become cashier of a bank, was remembered at the same time with a gold watch.

Arkansas, whose full crew law was the first statute on that subject to be sustained by the Supreme Court of the United States, has distinguished itself further by adopting another law requiring that the minimum switching crew shall consist of six men; an engineer, a fireman, a foreman and three helpers. This law applies to Arkansas cities of the first and second class, in all cases where switching movements are made across public crossings. The St. Louis, Iron Mountain & Southern contested the law in the court at Hot Springs, but was defeated, the court imposing a fine of $50 and costs for a violation of the law. The road will carry the case to the Supreme Court of the state.

The Secretary of the Interior announced at Washington last week that President Wilson had appointed William C. Edes and Lieutenant Frederick Mears as members of the Alaskan engineering commission, which is to have charge of the location of the railroads in Alaska, under the recently enacted Alaskan railroad act. Mr. Edes is chief engineer of the Northwestern Pacific. Lieutenant Mears is general superintendent of the Panama Railroad. The engineers will proceed to Alaska at once and it is understood that their first work will be the location of a route through the Sustina valley from the south coast to the Tanana river. This, according to the maps, is the route of a proposed extension of the Alaska Northern, which is now in operation from Seward, northward, 71 miles, to Kern Creek.

President W. G. Bierd, of the Chicago & Alton, has recently introduced on the Alton a plan for handling the assignment of crews, which he had previously tried with success on the Minneapolis & St. Louis. Day and night crew despatchers have been appointed for the principal engine terminals to have charge of the calling and assignment of both engine and train crews and cabooses, thereby concentrating duties that have been divided between the trainmasters, train despatchers, yard masters and enginehouse foremen. It is believed that the plan will eliminate friction and avoid a great deal of overtime which is caused, for example, by calling train crews too long before an engine is ready for a train, or by calling engine crews too long before a train is ready. The crew despatchers are located near the enginehouse and are in touch with the train despatchers by telegraph and telephone.

Railroad men are watching with considerable amusement and interest a case involving the Frisco Railroad and the Kansas City, Mexico & Orient. Both roads are in the hands of receivers and both have for their supreme boss a judge of the United States Court. The Kansas City, Mexico & Orient owes the Frisco $48,000 for the rent of a line between Foley and Ewing, Okla., 12 miles long. This line is absolutely necessary for the Orient. It is a stretch in the main line, the lack of which would mean that the northern portion of its main line would end at Foley and the southern at Ewing, 12 miles south of Foley. Eight years ago the Orient entered into a contract with the Frisco, agreeing to pay $6,000 a year for the use of this track, and also to share in the maintenance and improvement expenses. Sundry small and spasmodic payments have been

made from time to time, but the bill now rendered amounts to $48,000, which means that the Orient has not paid any rent to its Frisco landlord for eight years.

Senator La Follette of Wisconsin, speaking in the senate last Tuesday in support of his bill to make it a penal offense to attempt through other than the prescribed channels to influence the Interstate Commerce Commission, denounced the railroads for having conducted a campaign of publicity to further their application for authority to make a general increase of five per cent. in freight rates. Mr. La Follette had read the letters received by the commission, and called for by Congress, and he declared that many of them showed a "disgraceful" state of things. About 150 letters had been received at the White House and from there sent to the commission and these, in Mr. La Follette's view, had been handled in a way that indicated that the White House exercised undue influence over the commission. As a matter of fact, the letters had been referred to the commission in accordance with the usual routine in such matters. Numerous large business interests had sent letters to the commission and had recommended others to write to the commission or to congressmen, and in this, said the senator, these business men had been unduly influenced by the railroad.

The United States Civil Service Commission announces examinations for the position of examiner of accounts, for the Interstate Commerce Commission, all papers to be in by June 8. Applicants must be not over 47 years old and must show ability in one or more of the eleven different departments of the work done by the Division of Carriers' Accounts. They must show that they have had at least seven years' satisfactory practical experience in railroad or other common-carrier accounting service; in public accounting practice (as certified public accountant or in the office of a certified public accountant); in accounting work of the Interstate Commerce Commission, or with state commissions engaged in the effectual regulation of the affairs of common carriers or other public utilities, or that they have had seven years' combined experience in the several services indicated. The degree of certified public accountant when obtained as a result of the regular examination in the state conferring the degree will be accepted in lieu of three of the seven years' experience required of applicants. Accounting experience of a merely routine or nonresponsible character or along commercial lines will not be considered. Persons who competed in the examination for this position held on July 28, 1913, may enter this examination upon filing applications in due time showing them to be eligible.

Automatic Parcel Room

The Chicago & North Western has recently placed in the waiting rooms of a number of its more important stations automatic coin-controlled parcel-checking lockers, consisting of steel cabinets of various sizes in which passengers may check their own hand baggage, taking it out of the locker as desired, without delay, by the deposit of a coin. Thus far the cabinets have been liberally patronized by the passengers.

Transverse Fissures in Rails

The New York State Public Service Commission, Second district, has sent to the railroads of the state a little pamphlet containing a dozen half tone engravings, made from photographs, showing internal transverse fissures in rails. Last November, the commission issued to the railroads an order requiring special reports of failures of rails due to this cause, and the present circular has been prepared because the reports received indicated that in some cases the nature of the defects referred to was not clearly understood by the men who made the reports.

Restoration of Hartford Passenger Station

The New York, New Haven & Hartford has made plans for the restoration of the passenger station at Hartford, at an estimated cost of $220,000. This station was badly damaged by fire several weeks ago. The people of the city desired a new station, of course; they have been agitating for one for a long time past; but the officers of the road said that under the financial conditions now existing the expenditure necessary for a complete new plant was not warranted. The plans now in hand provide for the construction of an additionad story on the main part of the building and the reconstruction of rooms, stairways and passages throughout the structure in such a way as to provide a handsome and convenient station.

Red and White at Highway Crossings

The signal department of the Lehigh Valley has fitted a highway crossing gate at Bethlehem, Pa., with a lantern and a red glass so arranged that at night when the gate is down the indication to persons on the highway is red; while, when the gate is up, it is white. The light is hung on the bar in the usual way, and without a change of color it would give its indication at night by position alone—the upper position meaning that the crossing is clear and the lower meaning that it is obstructed. In addition, the light in question now shows red, by means of a roundel fixed to the bar in such a way that when the bar is down the light swings into a position behind the colored glass. When the bar is moved upward the light again shows white.

Express Companies' Net Income Cut in Half by Parcel Post

The Bureau of Railway News and Statistics has issued the following:

"As a result of the institution of the parcel post 11 express companies, covering a total of 302,759 miles of line, sustained a loss of 53.8 per cent. in net operating income during the first six months of the current fiscal year despite a gain in mileage of over 4,000 miles, as shown by figures of the Interstate Commerce Commission. The figures, giving earnings and expenses of the express companies from July 1 to December 31, 1913, afford the first official data from which the effect on express and railway revenues of the parcel post may be ascertained.

"Such a result, the cutting of operating income into less than one-half of the figure attained in six months of the previous year, even before the full expansion of the parcel post to its present weight limits and before reductions in both parcel post and express rates, emphasizes the advantage which has been held by the post office department, free of the commercial necessity of meeting its legitimately increased expenses due to parcel post by adequate increase in mail pay to the railways hauling the traffic.

"Gross business of the express companies fell from $91,422,020 in the six months to December 31, 1912, to $86,281,863 in the half year to December 31, 1913, a loss of over $5,000,000. In the same time gross revenues of all the railways rose some $10,000,000. Over a period of 10 years express receipts have shown an advance approximately twice as rapid relatively as gross railway receipts, so that naturally express receipts during the six months under review should have made a considerable gain instead of the loss reported, even had mileage remained stationary instead of increasing 4,338 miles.

"Payments to the railways for the six months, as a result of the drop in business, showed a contraction of $1,722,971. The official figures for the half year and the month follow:

Six months to December 31—	1913	1912	Loss
Gross receipts	$86,281,863	$91,422,020	$5,140,157
Express privileges	43,142,090	44,865,061	1,722,971
Operating revenue	43,139,772	46,556,959	3,417,187
Operating expenses	39,951,298	40,490,579	539,281
Net	3,188,473	6,066,379	2,877,906
Taxes	711,053	708,186	+2,867
Income	2,477,420	5,358,192	2,880,772
December—			
Gross receipts	$15,852,921	$17,941,660	$2,088,739
Express privilege	8,054,569	8,899,604	845,035
Operating revenue	7,798,352	9,042,055	1,243,703
Operating expenses	7,005,120	7,677,769	672,649
Net	793,232	1,364,285	571,055
Taxes	125,607	123,951	+1,656
Income	667,624	1,240,334	572,711
Mileage	302,759	298,421	+4,338

+ Increase.

"Discrepancies between the two years shown in the above figures are considered certain to be larger in the second six months from January 1 to June 30, since the greatest expansion of the parcel post did not come until January 1, when the weight limit for first and second zones was advanced from 20 to 50 pounds and in the remaining zones from 11 to 20 pounds, while rates were reduced in all, excepting the first, second, seventh and eighth zones. On February 1, moreover, occurred the reduction of 16 per cent. in rates of the express companies.

"As the railways receive approximately 50 per cent. of the express rate for their service of hauling, their revenues from

express will show a correspondingly greater contraction in the second half year, while expenses of mail haulage will be correspondingly increased through enlarged parcel post traffic without corresponding compensation."

Regulation of Demurrage in Texas

C. L. McManus, of Brownsville, Tex., has been appointed supervisor of demurrage [on freight cars] for the state of Texas, with office at Austin. This appointment has been made by the executive committee of the American Railway Association, which association, through its Committee on Relations Between Railroads, now has supervisory authority over demurrage matters.

The Attica Bridge Accident

The accident to the Continental Limited train on the Wabash, in which an engine and two cars fell with two spans of the bridge across the Wabash river at Attica, Ind., was referred to in our issue of April 10. Since that time further details have become available.

This bridge consisted of six Pratt truss spans varying in length from 108 ft. to 151 ft., with 12 78-ft. deck girder spans forming the west approach. Shortly before noon on Sunday, April 5, a freight train of about 50 cars was passing the station at Attica when the rear truck of a refrigerator car jumped the track. It ran on to the bridge, and the truck broke loose from the car just as it reached the first span, and after making a complete horizontal revolution, struck the end post on the south side of the bridge with such force that the post was bent laterally about 12 in., shearing many rivets in the cover plate and splitting the cover plate for a distance of 8 ft. on one side and 4 ft. on the other at the junction of the angle at the cover plate. The train ran almost across the bridge before it was stopped, so that the derailed car was in the center of the second span from the east end before it came to a stop, at which time the car became uncoupled and the rear end of the body fell to the rails.

The forward end of the train was uncoupled from the refrigerator car and proceeded to Williamsport, a distance of three miles, while the rear end was removed by the engine of the wrecking crane. As soon as the forward engine returned to the bridge the refrigerator car was jacked up and was pushed over the damaged span, without any noticeable further damage to the span.

Since the bridge had held this engine, which was of the heaviest class used on the road, the track supervisor assumed that the passenger train, pulled by a lighter engine could safely cross the bridge. However, when the passenger engine was just leaving the bridge, the structure collapsed, throwing the locomotive down the bank and stopping the train suddenly. The remainder of the train struck the engine tender and buckled out to the north, carrying the second span from the east end off its bearing on the pier and practically wrecking it. Thus, the locomotive, tender, baggage car and combination car went down with the structure, while a coach stood inclined on end, as half of the longest span remained on the westward pier. A sleeping car and a dining car remained on the track on the third span. All of the cars remained in a vertical position, and it is said that the spans gave way very slowly. None of the cars were damaged except the combination car, where one of the bridge posts struck the roof.

Following the accident, stress sheets were prepared showing the load caused by the heavy engine when returning over the bridge with the derailed refrigerator car and also with the passenger train. From these stress sheets it is shown that the load occasioned by the passenger train was less in the latter instance, the unit flange stress under the loading at the time of the accident being 9,000 lb. per sq. in. in stringers, and 10,100 lb. per sq. in. in floor beams, as compared with 10,500 lb. and 11,100 lb., respectively, with the freight locomotive. Shearing stresses were likewise less.

Scranton School Car on Southern Pacific

The Southern Pacific has made arrangements with the railway department of the International Correspondence Schools of Scranton, Pa., to extend its system of education to the road's employees. In connection with these arrangements the Southern Pacific has leased from the schools one of their locomotive and air brake instruction cars. The car will be under the direction of the railway company, and all employees interested will be given the free use of this car, on which lectures will be given and demonstrations made of the handling of air brakes and the operation of locomotive mechanism. The taking of scholarships or courses of study is voluntary on the part of the employees themselves. Employees desiring to take up any branch of study taught by the schools, because of this arrangement, will be granted special discounts from the regular prices of any scholarships they may select.

A "Strike" in the Dull Season

"Brotherhood of Federated Railroad Employees," is the name adopted by agitators who have been trying to "organize" shopmen at Altoona and other places on the Pennsylvania Railroad, and who have got the newspapers to print numerous items concerning the strikes which they propose to order. Commenting on the published statements, the general manager of the road on May 1 said:

"One hundred and forty-eight men on the Williamsport division, comprising shop men, truckers in freight houses and trackmen, failed to report for work yesterday. They were immediately notified that they were discharged from the service and to call for the pay due them. Under no circumstances will they be taken back into the service of the company. Their places will be filled from the ranks of employees who have been on furlough.

"From what can be learned, the men who refused to work did so because the company, in reducing forces recently, followed the rule of discharging first the least efficient men rather than in some cases retaining some of the inefficient employees because they had been longer in the service than others. In all demotions as well as promotions, fitness and ability take precedence over all other qualifications for employment. . . ."

Train Accidents—Unclassified

[From the St. Louis Republic.]

Near Edwardsville, yesterday, an Illinois terminal freight train of 66 cars detached from the engine, coasted down a hill, crashed into the engine and thence, with the tender on top of a coal car and another car torn from its trucks, passed safely over three bridges. Brakemen in the caboose at the end of the train knew nothing of the accident until it was all over. The engineer and fireman, who were at their posts when the crash came, escaped injury.

The string of cars had been stopped near the top of the hill, and, after doing some switching, the engine proceeded down the hill to take water at a tank a quarter of a mile ahead.

When the train began to move slowly the brakemen in the caboose thought the engine had hitched on, and paid no attention. By the time it reached the engine the train was moving rapidly and, while the crash hurled the tender on top of a coal car and tore away the trucks from beneath another car, the pace was not slackened nor was the shock felt by the crew in the caboose.

Pushing the engine before it, the runaway rushed westward and crossed the Cahokia Creek bridge, which is 70 feet high, and then another high bridge over an arm of the creek, finally coming to a standstill on level ground.

Mail-Pay Committee Appeals to Congress

The Committee on Mail Pay, Ralph Peters, New York City, chairman, has again memorialized Congress concerning the anomalous and inequitable conditions which the government imposes on the railways of the country in this matter, and four definite suggestions are offered, namely:

1. That the mails should be weighed annually (instead of quadrennially, as at present) and payment made for the weight and distance carried.
2. That mail apartments in railroad cars fitted up as traveling post offices should be paid for.
3. That side and terminal passenger service between railroad stations and post offices, and other special services, should be paid for.
4. That all rates of pay and conditions of service should be definite and not subject to the discretion of employees of the Post Office Department.

It is the belief of managers that the adoption of these general principles, and establishing fair units of pay will remove this complicated subject from public controversy. The memorial fills a pamphlet of 25 pages and explains the mistaken and preju-

diced methods which the Post Office Department has followed in its arguments against the railroads.

Transportation of Dressed Poultry

The Department of Agriculture has made extensive experiments to test the efficiency of refrigerator cars in the shipment of dressed poultry. Examinations and records were made of 120 car-load shipments which traveled an aggregate of 140,000 miles. The hauls averaged between 1,000 and 1,500 miles, and terminated generally in New York City. No car was used twice, and many different types of refrigerator cars were employed. The shipments were made in winter and summer, so that the effect of outside temperatures could be determined. The reports say that the builders of refrigerator cars have not kept pace with the refrigerating industry in general. The poultry shipped in these cars was carefully prepared and chilled for 24 hours to 32 deg. F., packed in one dozen to the box, and the boxes placed in refrigerator cars which had been iced 24 hours before loading. Accurate chemical analyses of the conditions of the poultry were made prior to the shipment, special attention being given to the percentage of ammoniacal nitrogen in the muscle tissue, which is an accurate index of the degree of deterioration in the flesh of dressed poultry.

The poultry after arrival at destination was kept under examination while in the wholesale commission houses, and at the retailers'. From a large number of chemical tests the conclusion is reached that if the car temperature is above 35 deg. F. the poultry when it reaches the market has the disadvantage of a deterioration equivalent to five or more days in the market, and must be consumed five days earlier than that arriving at car temperatures below 24 deg. F.

The experiments indicated that less than 31 deg. F. is the most satisfactory temperature of dressed poultry for long hauls. A ten-degree rise in the temperature of the car during the haul makes a difference in keeping time on the New York market. It seems to be impossible to stop decay by the use of low temperatures once the decay has gained a foothold.

The report says that most of the refrigerated carriers of the United States are not built to maintain optimum condition during warm weather.

The insulation of the car in relation to temperature is its most vulnerable part, with the character of the ice bunker next in importance. In the past the insulation has not been sufficiently heavy and the bunker has not been so built as to distribute its refrigerating effect evenly throughout the car. The use of a dead air space in cars is not found to be successful. Cork, the best known insulator, which is almost impervious to water and contains practically no nitrogenous material which might produce decay, has not been used to any great extent in car construction. Wool and hair felt are good insulators, but their high percentage of nitrogenous material makes them good bacterial media when moist. Mineral wool is least subject to decay, but its nonadhesive qualities hinder the manufacture of strong material.

The most efficient cars studied were those having the best insulated and best built roofs.

International Railway Fuel Association

The program for the convention of the International Railway Fuel Association, which is to meet at the LaSalle hotel, Chicago, Ill., May 18 to 21, inclusive, has just been issued. The convention will last four days, and there will be afternoon sessions on Monday, May 18, and Wednesday, May 20. The opening address will be made by Dr. W. F. M. Goss, chief engineer, Chicago Association of Commerce, Committee on Investigation of Smoke Abatement and Electrification of Railway Terminals. The following is a list of the papers to be read: Monday, May 18, Honeycombing and Clinker Formation, by S. W. Parr, University of Illinois; Relation of Front End Design and Air Openings of Grates and Ash Pans to Fuel Consumption and Sparks, by M. C. M. Hatch, Delaware, Lackawanna & Western, and A Uniform Method of Computing Locomotive Fuel Consumption for Office Statistics and Trip Performance, by C. F. Ludington, Atchison, Topeka & Santa Fe.

Tuesday, May 19, Storage of Coal—Its Feasibility and Advantages to Producer, Carrier and Consumer, by C. G. Hall, Chicago & Eastern Illinois; and Sizing of Coal for Locomotive Use, by Alonzo G. Kinyon, Clinchfield Fuel Company.

Wednesday, May 20, Committee Reports on Fuel Stations, H. J. Slifer, consulting civil engineer, chairman, and Firing Practice, D. C. Buell, director of Railway Educational Bureau, chairman; Coal Space and Adjuncts on Locomotive Tenders, by L. R. Pyle, traveling fireman Minneapolis, St. Paul & Sault Ste. Marie, and Pre-Heating of Feed Water for Locomotive Boilers, by M. B. Lanier, Monroe-Warrior Coal & Coke Company.

Thursday, May 21, Economies in Round House and Terminal Fuel Consumption, F. W. Folz, Missouri Pacific. The topical discussions will come in the last session, as will the election of officers.

Exhibitors at the Air Brake Association Convention

The twenty-first annual convention of the Air Brake Association was held at the Hotel Pontchartrain, Detroit, Mich., May 5-8. A report of the proceedings will be given in next week's issue. The following is a list of the exhibitors:

American Steel Foundries, Chicago.—Brake beams. Represented by W. E. Fowler, Jr., and C. C. Hopkins.

Anchor Packing Company, Philadelphia.—Air pump gaskets and superheater packing. Represented by E. C. Adams.

Ashton Valve Company, Boston.—Gages, recorders and gage testers. Represented by W. H. Foster.

Automatic Safety Air Hose Coupler Company, Michigan City, Ind.—Air hose couplings. Represented by Oliver P. Wilhelm.

Brown & Co., Tom, Chicago.—Reamers for air brake equipment. Represented by H. W. Stannard.

Central Railway Signal Company, Pittsburgh.—Universal flexible air pump packing. Represented by C. B. Brown.

Detroit Lubricator Company, Detroit.—Locomotive lubricators and automatic flange lubricators. Represented by A. D. Howard and A. G. Machesney.

Dixon Crucible Company, Jos., Jersey City.—Lubricant and graphite for air brake equipment. Represented by L. H. Snyder.

Emery Pneumatic Lubricator Company, St. Louis, Mo.—Brake cylinder lubricant. Represented by E. A. Emery and H. C. Miller.

Flexible Railway Supply Company.—Steam, water and air flexible connections. Represented by Charles Forth.

Gold Car Heating & Lighting Company, New York.—Pressure regulators. Represented by A. E. Robbins.

Greene, Tweed & Co., New York.—Palmetto packing for railway service. Represented by A. J. Richardson.

Johns-Manville Company, H. W., New York.—Flexible hose, piston packing rings, air brake pump packing. Represented by H. A. Waldron, George A. Nichol and George Christenson.

New York & New Jersey Lubricant Company, New York.—Non-fluid oil air brake lubricant and C. & O. triple valve lubricant. Represented by J. H. Bennis.

Standard Heat & Ventilation Company, New York.—Temperature regulators. Represented by George B. Culver.

United States Metallic Packing Company, Philadelphia.—Metallic air pump packing. Represented by J. J. Cizek.

Railway Storekeepers' Association

The following is the program of the eleventh annual convention of the Railway Storekeepers' Association to be held at the Hotel Raleigh, Washington, D. C., on May 18, 19 and 20:

MONDAY, MAY 18

9 a. m.—Enrollment. Convention called to order, Invocation by the bishop of Washington; address of welcome, Oliver P. Newman, commissioner of the District of Columbia; address, the president of the association; address, Fairfax Harrison, president Southern Railway; reports of the secretary-treasurer and the accounting committee.

2:00 p. m.—Reception by the President of the United States.

2:30 p. m.—Convention picture.

3:00 p. m.—Convention session; subject K-1, Stores Department Expenses, E. L. Fries; report, finance committee; report, committee on Book of Standard Rules.

8:00 p. m.—Convention session.

TUESDAY, MAY 19.

9 a. m.—Convention session; continuation of report of Committee on Book of Standard Rules; subject K-3, Handling of Stationery, S. G. Pettit; report, Piece Work Committee.

9:30 a. m.—Visit to principal buildings and statues in city. The afternoon will be used for trips to Mount Vernon, Va., and Marshall Hall, Md.

WEDNESDAY, MAY 20

Convention called to order at 9 a. m.; report, committee on Recommended Practices; report, Scrap Committee; subject K-2; How to Obtain the Greatest Efficiency from Employees in the Stores Department, E. J. Roth and W. D. Stokes; report,

committee on Standard Buildings; report, committee on Couplers and Parts; report, Membership Committee, subject K-4, Classification of Electric Railway Materials; committee on Resolutions; election of officers.

Traffic Club of New York

A special committee was appointed at the regular meeting of the club in March to consider the practicability of establishing permanent headquarters for the club, and a special meeting for the purpose of receiving the report and discussion of the subject has been called for Thursday, May 14, at 8 o'clock at the Waldorf-Astoria.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, 143 Liberty St., New York.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, I. C. R. R., East St. Louis, Ill.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, St. Louis, Mo.; 3d Thursday and Friday in May.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 29 W. 39th St., New York.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—H. G. McConnaughy, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York. Next meeting, May 20, Hotel Biltmore, 43d St., New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 20-22, 1914, Los Angeles, Cal.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention, March 16-18, 1915.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Karpen Building, Chicago. June 15-17, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—A. R. Davis, Central of Georgia, Macon, Ga. Next convention, July 20-22, Hotel Sherman, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa. Next annual meeting, June 30 to July 4, Hotel Traymore, Atlantic City, N. J.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. W. Hunt, 220 West 57th St., New York; 1st and 3d Wed., except June, July and August, New York. Annual convention, June 2-5, Baltimore, Md.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wemlinger, 11 Broadway, New York; 2d Thursday of each month, at 2 P. M., 11 Broadway, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. June 16-19, St. Paul-Minneapolis, Minn.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Next convention, January 19-21, 1915, Chicago.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, Highland Park, Ill. Annual meeting, June 24, Minneapolis, Minn.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—C. W. Egan, B. & O., Baltimore, Md. Next convention, May, St. Paul, Minn.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago. Semi-annual meeting, June 12, Hotel Denis, Atlantic City, N. J. Annual convention, October 19-23, Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 112 West Adams St., Chicago. Next convention, May 19-22, New Orleans, La.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Annual meeting, Hotel Chalfont, Atlantic City, N. J., June 18-19.

ASSOCIATION OF WATER LINE ACCOUNTING OFFICERS.—W. R. Evans, Chamber of Commerce, Buffalo, N. Y.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—L. D. Mitchell, Detroit Graphite Co., Detroit, Mich. Meeting with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que.; 1st Thursday, October, November, December, February, March and April, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawler Ave., Chicago; 2d Monday in month, except July and August, Lytton Bldg., Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Fri. in Jan., May, Sept. and Nov. and 2d Thurs. in March, Hotel Statler, Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—Edw. J. Dugan, P. O. Box 654, St. Paul, Minn.; 2d Monday, except June, July, August and September, Old State Capitol Bldg., St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—Edw. R. Dasher, Box 75, Harrisburg, Pa.; 1st Friday after 10th of each month, except July and August, 31 So. Front St., Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, Oliver Bldg., Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va. Next convention, May 13, Hotel Galvez, Galveston, Tex.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 605 Grand Central Station, Chicago; Wed. preceding 3d Thurs., Transportation Bldg., Chicago.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, 11, rue de Louvain, Brussels, Belgium. Convention, 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. G. Hall, 922 McCormick Bldg., Chicago. Annual convention, May 18-21, Hotel La Salle, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 829 West Broadway, Winona, Minn. Next convention, July 14-17, Hotel Sherman, Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Next convention, third Tuesday in August.

MAINTENANCE OF WAY MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—T. I. Goodwin, C. R. I. & P., Eldon, Mo. Next convention, November 17-19, 1914, Detroit, Mich.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Next annual meeting, May 25-28, Hotel Walton, Philadelphia.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Karpen Building, Chicago. June 10-12, Atlantic City, N. J.

MASTER CAR & LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next convention, September 8-11, Nashville, Tenn.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Next convention, March 15 to 19, 1915, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings monthly.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, Union Station, Peoria, Ill.; 2d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILROAD MASTER TINNERS, COPPERSMITHS & PIPEFITTERS' ASSOCIATION.—U. G. Thompson, C. & E. I., Danville, Ill. Annual meeting, May 19-22, Marquette Hotel, St. Louis, Mo.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—W. Nicholson, Kansas City Southern, Kansas City, Mo.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec, Engrs.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Mobile & Ohio, Mobile, Ala. Annual meeting, 1st Tuesday in October.

RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa. New York, May 27 and 28. Annual meeting, Bluff Point, N. Y., September 22-24.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio. Next convention, May 18-20, Hotel Raleigh, Washington, D. C.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with M. C. B. and M. M. Associations. Atlantic City, June 10 to 17.

RAILWAY TELEGRAPH & TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Assoc. of Ry. Teleg. Supts.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va.; 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. W., Sterling, Ill. Next convention, September 8-10, 1914, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.

SALT LAKE CITY TRANSPORTATION CLUB.—R. E. Rowland, Hotel Utah Bldg., Salt Lake City, Utah; 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meeting with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—Carl Nyquist, La Salle St. Station, Chicago.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Atlanta, Ga. Next meeting, July 16, Chattanooga, Tenn.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., 10 A. M., Candler Bldg., Atlanta.

TOLEDO TRANSPORTATION CLUB.—J. S. Marks, Agent, Interstate Despatch, Toledo, Ohio; 1st Saturday in month, Boody House, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillsburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York; last Tuesday in month, except June, July and August, Waldorf-Astoria, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie R. R., Pittsburgh, Pa.; meetings bimonthly, Pittsburgh. Annual meeting, 2d Monday in June.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library Building, St. Louis, Mo. Annual meeting in November. Noonday meetings October to May.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next convention, June 16, Jacksonville, Fla.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Supt.'s office, L. S. & M. S., Detroit, Mich.; meetings monthly, Normandie Hotel, Detroit.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y. Next meeting, August, Chicago.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, Newhouse Bldg., Salt Lake City, Utah; 3d Friday of each month, except July and August, Consolidated Music Hall, Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Building, Chicago; 3d Tuesday of each month, except June, July and August, Karpen Building, Chicago.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; regular meeting 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings.

REVENUES AND EXPENSES OF RAILWAYS

EIGHT MONTHS ENDING FEBRUARY 28, 1914

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase. (or decr.) comp. with last year.
		Freight.	Passenger.	Total. inc. misc.	Maintenance Way and structures.	Maintenance Of equipment.	Traffic.	Transportation.	General.	Total.					
Alabama & Vicksburg	142	$829,180	$349,950	$1,272,012	$193,689	$268,674	$31,117	$449,941	$46,983	$990,406	$281,605	—$3,443	$68,842	$209,319	—$66,003
Alabama Great Southern	309	2,496,715	903,690	3,691,370	441,593	909,332	108,299	1,226,027	83,064	2,768,317	923,052	—3,531	127,187	792,333	—134,028
Ann Arbor	291	949,867	381,327	1,432,549	160,666	199,700	40,557	531,615	54,546	987,086	445,462	—142	108,970	336,350	14,015
Arizona & New Mexico	108	546,381	73,285	647,617	88,104	75,157	6,382	127,049	24,430	321,125	326,492	.....	21,383	305,109	—77,492
Arizona Eastern	366	1,432,380	304,353	1,829,017	237,305	239,195	16,255	507,077	85,900	1,085,735	743,281	17	111,618	631,681	—208,288
Atchison, Topeka & Santa Fe	8,348	40,560,087	16,699,314	62,083,432	8,651,149	11,022,178	1,434,412	18,078,555	1,480,355	40,666,651	21,416,780	.....	3,141,573	18,275,207	—1,884,784
Atlanta & West Point	92	440,724	337,858	871,895	120,926	178,872	41,638	271,216	37,435	650,089	221,806	1,848	54,411	169,243	—16,580
Atlanta, Birmingham & Atlantic	645	1,712,903	483,041	2,393,318	391,039	386,492	114,352	933,088	89,793	1,914,767	478,550	.....	114,694	363,855	70,561
Atlantic & St. Lawrence	166	769,090	247,127	1,104,499	182,084	173,877	34,904	530,207	34,198	955,272	149,227	.....	81,256	67,971	72,416
Atlantic City	166	495,592	1,042,008	1,627,538	311,436	103,376	22,737	819,801	11,193	1,268,544	358,993	—25,761	84,000	249,232	13,895
Atlantic Coast Line	4,628	15,944,437	6,146,683	23,894,670	3,347,995	3,877,826	433,920	8,467,650	804,974	16,932,366	6,962,303	—4,808	1,056,000	5,901,495	—615,489
Baltimore & Ohio	4,456	51,537,581	10,919,131	66,286,441	8,479,739	11,216,358	1,493,496	26,414,226	1,544,402	49,148,224	17,138,217	—636,785	2,201,141	14,300,290	—2,961,526
Baltimore & Ohio Chicago Terminal	77	.....	5,460	1,121,172	143,743	182,580	5,980	523,654	40,833	896,792	224,379	6,240	144,880	85,739	—23,547
Bangor & Aroostook	630	1,765,896	463,270	2,346,832	337,297	338,835	20,892	833,728	80,275	1,611,029	735,803	1,266	78,799	655,737	166,915
Belt Railway Company of Chicago	21	.....	.....	2,000,583	199,197	204,815	4,462	817,561	51,119	1,277,155	723,428	.....	77,233	646,194	—49,916
Bessemer & Lake Erie	203	5,501,696	294,535	5,888,349	574,318	1,578,611	83,667	1,544,046	114,099	3,894,743	1,993,605	.....	264,000	1,729,605	—723,903
Bingham & Garfield	26	1,104,704	34,934	1,145,840	76,227	156,124	7,242	173,099	19,174	431,869	713,970	.....	23,527	690,443	303,245
Birmingham Southern	43	481,225	8,320	807,474	137,284	110,930	4,093	279,677	36,552	568,539	238,935	.....	18,182	220,752	—60,727
Boston & Maine	2,251	18,456,628	10,949,598	31,868,457	4,649,583	4,994,249	295,414	14,943,192	879,852	25,762,291	6,106,166	132,175	1,384,578	4,853,762	—1,227,285
Buffalo & Susquehanna	91	284,349	74,263	380,442	84,403	180,653	4,346	165,840	23,287	458,537	—78,090	15	12,800	—90,905	9,756
Buffalo, Rochester & Pittsburgh	578	6,595,147	825,702	7,666,237	957,118	1,512,054	101,225	2,714,871	161,599	5,446,869	2,219,367	—1,248	144,000	2,074,118	17,247
Butte, Anaconda & Pacific	90	815,366	103,425	1,003,166	121,619	160,629	5,254	361,607	28,091	677,202	325,963	.....	20,755	305,208	199,081
Canadian Pacific (Lines in Maine)	233	599,338	216,563	891,027	275,173	144,734	53,657	423,323	41,893	938,782	—44,754	.....	88,000	—135,754	—100,786
Carolina, Clinchfield & Ohio	248	1,591,072	142,138	1,767,986	120,280	215,633	54,276	321,840	72,264	784,295	983,690	.....	84,000	899,690	9,401
Central New England	296	2,053,026	312,309	2,488,342	356,872	293,517	19,680	871,012	35,251	1,567,334	921,008	—3,993	86,000	831,014	—272,867
Central of Georgia	1,924	6,425,403	2,666,686	9,932,074	1,343,757	1,955,186	280,332	3,327,199	319,831	7,226,307	2,705,767	50,852	422,151	2,334,468	48,417
Central R. R. of New Jersey	676	13,693,072	3,849,784	18,231,746	2,103,507	3,055,162	261,297	5,812,017	365,843	11,597,829	6,633,917	36,007	888,811	5,781,113	—1,975,364
Central Vermont	411	1,754,681	729,064	2,681,149	460,009	530,631	72,384	1,401,145	68,308	2,532,478	148,670	2,710	124,000	27,381	—306,182
Charleston & Western Carolina	340	1,068,982	275,710	1,408,060	258,630	220,295	26,716	535,473	37,102	1,078,218	329,842	.....	40,000	289,842	35,699
Chesapeake & Ohio	2,342	18,968,641	4,150,696	24,253,787	2,656,745	5,153,719	448,534	8,003,139	608,133	16,870,273	7,385,513	3,391	904,452	6,482,452	—233,402
Chicago & Alton	1,025	6,263,090	2,886,122	9,919,237	1,236,597	2,498,469	354,027	3,930,197	304,758	8,324,050	1,595,186	—24,593	352,700	1,217,892	—482,741
Chicago & Eastern Illinois	1,283	8,054,136	2,050,214	10,987,149	1,748,463	2,860,353	192,324	4,086,927	312,992	9,201,062	1,786,087	—21,555	402,900	1,361,632	—1,071,175
Chicago & Erie	269	2,818,217	473,149	3,638,867	755,939	922,894	172,363	1,947,311	107,731	3,906,239	—267,371	—30,327	121,979	—419,678	—452,041
Chicago & Northwestern	8,058	36,821,458	14,832,196	56,885,866	7,729,832	8,182,084	930,204	21,666,801	1,170,361	39,679,284	17,206,581	169	2,692,000	14,514,751	—869,692
Chicago, Burlington & Quincy	9,128	43,473,983	15,244,381	64,497,936	6,986,222	10,651,681	1,081,389	20,718,448	1,553,232	40,990,974	23,506,961	—115,520	2,440,707	20,950,733	—1,881,080
Chicago Great Western	1,496	6,694,921	2,239,395	9,671,569	1,426,301	1,514,214	381,969	3,605,405	288,932	7,261,822	2,409,746	—4,200	309,538	2,096,007	—319,805
Chicago, Indiana & Southern	358	2,619,943	219,432	2,931,935	442,171	947,417	72,624	1,055,661	83,819	2,601,695	330,240	2,350	131,756	200,834	—384,803
Chicago, Indianapolis & Louisville	616	3,108,811	1,146,124	4,665,357	690,985	716,145	153,007	1,762,618	129,019	3,451,776	1,213,580	.....	203,022	1,010,558	—159,989
Chicago Junction	11	.....	.....	1,379,341	146,032	134,312	9,373	738,401	36,758	1,064,878	314,472	69,196	22,022	361,646	—30,761
Chicago, Milwaukee & St. Paul	9,690	44,315,044	12,923,986	62,404,195	7,341,041	9,190,736	1,251,354	22,957,036	1,155,565	41,895,734	20,508,461	152,282	2,705,811	17,954,932	—2,127,717
Chicago, Peoria & St. Louis	255	837,380	226,040	1,129,661	230,637	277,025	54,026	556,469	41,783	1,159,943	—30,282	.....	38,400	—68,682	—121,994
Chicago, Rock Island & Gulf	476	1,389,911	458,314	1,996,294	230,307	264,275	77,258	791,736	63,483	1,427,061	569,233	—7,205	—79,796	482,230	—370,197
Chicago, Rock Island & Pacific	7,684	28,931,883	12,742,698	44,540,362	5,685,130	6,282,937	1,233,387	18,442,393	1,271,979	32,915,829	11,624,533	—115,756	2,273,096	9,235,680	—861,856
Chicago, St. Paul, Minneapolis & Omaha	1,746	7,877,173	3,741,617	12,396,449	1,657,893	1,506,066	233,487	4,716,127	290,130	8,403,705	3,992,744	12,912	636,246	3,369,410	255,668
Chicago, Terre Haute & Southeastern	361	1,329,094	138,937	1,503,024	223,106	428,425	29,818	48,161	70,986	1,240,498	262,525	—2,215	92,000	168,310	—112,260
Cincinnati, Hamilton & Dayton	1,014	4,895,874	1,142,928	6,756,062	1,153,997	1,225,668	171,624	3,317,070	164,561	6,032,923	723,138	.....	278,688	444,449	—1,045,716
Cincinnati, New Orleans & Texas Pacific	337	5,512,763	1,404,254	7,264,181	710,780	1,843,043	202,553	2,122,337	164,416	5,043,131	2,221,050	—8,673	244,000	1,968,376	—282,315
Cincinnati Northern	244	814,336	161,923	1,020,321	253,320	287,401	22,043	447,579	28,905	1,039,250	—18,929	.....	46,059	64,988	—228,467
Cleveland, Cincinnati, Chic. & St. Louis	2,364	16,366,139	6,210,303	24,741,191	3,646,138	6,267,101	638,577	10,847,547	555,853	21,955,217	2,785,974	—8,393	973,667	1,803,913	—4,438,926
Colorado & Southern	1,126	3,929,095	1,067,946	5,340,266	728,905	1,041,706	86,597	1,919,340	175,263	3,951,813	1,388,453	—6,551	262,820	1,119,080	—509,162
Colorado Midland	337	938,897	196,496	1,244,684	251,675	295,717	64,279	554,753	46,003	1,192,429	52,255	—3,756	68,030	—19,501	—180,149
Cumberland Valley	162	1,749,470	488,804	2,343,885	504,253	277,013	42,629	808,142	68,581	1,700,620	643,265	1,338	49,154	595,448	—116,729
Delaware & Hudson	880	12,800,256	2,231,769	15,598,487	1,210,066	2,449,206	218,035	5,855,712	533,751	10,266,772	5,331,714	—11,778	433,503	4,866,432	—1,269,755
Delaware, Lackawanna & Western	959	19,207,452	5,840,232	26,833,573	3,137,624	4,121,808	579,963	8,397,581	549,578	16,786,556	10,047,016	300,164	1,360,000	8,987,181	—1,276,117
Denver & Rio Grande	2,583	11,901,030	3,686,950	16,293,725	2,342,595	2,967,656	339,578	5,135,375	426,456	11,211,662	5,082,062	—980	738,600	4,342,482	—624,595
Denver & Salt Lake	229	500,753	256,589	802,231	143,745	123,577	17,069	259,881	34,639	578,912	223,319	.....	32,000	191,319	—13,917
Detroit & Mackinac	411	499,393	234,872	788,204	92,030	127,397	18,735	296,377	21,538	556,079	232,124	568	69,311	163,381	—4,728
Detroit & Toledo Shore Line	78	1,080,370	.....	1,092,338	102,340	85,615	14,008	305,744	21,432	529,139	563,198	.....	46,003	517,195	84,465
Detroit, Grand Haven & Milwaukee	190	1,009,967	459,353	1,722,583	201,249	238,389	54,616	912,336	42,436	1,448,979	273,603	573	28,800	245,377	170,566
Detroit, Toledo & Ironton	441	820,431	97,188	1,010,952	324,843	361,504	20,621	679,939	46,860	1,433,769	—422,816	.....	45,600	—468,416	—515,307

REVENUES AND EXPENSES OF RAILWAYS

EIGHT MONTHS ENDING FEBRUARY 28, 1914—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance										
		Freight.	Passenger.	Total. inc. misc.	Way and structures.	Of equipment.	Traffic.	Transportation.	General.	Total.					
Duluth & Iron Range	277	$4,691,502	$201,179	$4,971,771	$613,596	$541,346	$9,571	$1,177,550	$126,498	$2,468,562	$2,503,208	$1,630	$267,895	$2,236,944	—$125,526
Duluth, Missabe & Northern	358	5,404,877	257,520	5,722,526	699,344	716,215	18,922	1,158,793	121,097	2,714,373	3,008,152	18,210	325,434	2,700,929	—110,876
Duluth, South Shore & Atlantic	627	1,386,649	777,410	2,320,165	520,552	279,943	69,721	880,047	88,829	1,839,094	481,071	7,063	159,234	328,899	8,483
Duluth, Winnipeg & Pacific	181	992,274	197,881	1,212,560	201,649	203,271	16,602	458,617	46,177	926,318	286,241	.....	60,651	225,589	45,349
Elgin, Joliet & Eastern	803	7,303,808	33	7,824,341	1,196,968	1,679,004	46,490	2,340,060	173,831	5,436,354	2,387,986	.....	265,534	2,122,452	—1,571,839
Erie R. R.	1,987	25,722,136	6,253,842	35,118,641	4,387,283	6,813,482	846,069	12,688,460	874,463	25,609,759	9,508,882	—213,463	1,259,515	8,035,903	—2,924,197
Florence & Cripple Creek	86	663,647	149,207	828,394	109,116	78,154	17,061	241,621	34,424	480,378	348,016	.....	37,621	310,394	—51,650
Florida East Coast	680	1,523,621	1,274,475	3,188,310	587,045	518,438	69,423	1,161,585	93,456	2,429,949	758,360	—1,812	160,000	596,548	—67,890
Fort Worth & Denver	454	2,187,181	1,056,826	3,415,256	416,065	524,680	58,510	1,357,360	126,080	2,482,697	932,558	—4,092	129,252	799,213	—461,322
Galveston, Harrisburg & San Antonio	1,338	5,454,706	2,161,301	8,055,341	984,122	1,506,950	276,008	2,316,101	275,868	6,359,051	1,696,290	—22,086	428,700	1,245,502	—459,787
Georgia R. R. Lessee Organization	307	1,497,624	645,568	2,303,981	223,473	389,888	92,373	1,012,764	70,613	1,789,114	514,867	.....	22,681	492,185	276,469
Georgia Southern & Florida	395	984,667	585,355	1,779,244	224,392	347,636	65,925	719,636	81,767	1,439,358	339,885	—723	91,453	247,707	—24,900
Grand Rapids & Indiana	575	2,146,518	1,347,069	3,774,095	522,170	589,992	100,898	1,666,530	126,684	3,006,276	767,818	—3,046	192,826	571,944	156,264
Grand Trunk Western	347	2,932,102	1,535,782	4,749,331	551,884	871,232	178,303	2,224,047	141,745	3,967,213	782,118	—14,886	252,000	515,231	—544,952
Great Northern	7,770	38,786,871	10,685,800	53,015,399	7,103,534	6,659,139	892,844	14,605,320	948,920	30,209,758	22,805,640	104,153	2,964,278	19,945,515	—1,959,480
Gulf & Ship Island	307	1,015,783	276,786	1,379,810	173,038	264,295	23,324	375,230	67,466	903,355	476,455	—23	60,457	415,974	—22,576
Gulf, Colorado & Santa Fe	1,595	6,468,764	2,109,397	9,106,725	1,491,463	1,414,389	209,952	3,455,646	263,008	6,834,460	2,272,264	.....	424,614	1,847,650	—742,330
Hocking Valley	35	4,119,870	643,704	5,109,879	508,877	1,058,260	75,387	1,718,278	118,711	3,479,515	1,630,363	.....	322,800	1,307,536	—284,226
Houston & Texas Central	789	3,108,695	1,309,293	4,739,592	685,924	655,120	120,381	2,129,753	147,542	3,738,722	1,000,870	1,305	238,453	761,111	—247,495
Houston East & West Texas	190	633,495	279,211	968,169	139,350	100,766	15,639	414,114	33,569	703,440	264,729	.....	41,347	223,381	—4,027
Illinois Central	4,762	29,756,802	9,494,456	44,779,985	6,234,419	9,762,605	866,594	16,391,313	1,088,523	34,343,456	10,436,528	—14,231	2,169,334	8,252,962	401,489
Indiana Harbor Belt	104	.....	.....	2,120,467	310,745	265,838	22,918	1,036,141	61,969	1,697,614	422,853	19,932	51,541	391,244	—227,829
International & Great Northern	1,159	5,113,033	1,599,062	7,181,052	1,094,060	867,161	211,952	3,044,118	266,356	5,483,650	1,697,402	—14,349	219,841	1,463,211	—597,993
Kanawha & Michigan	176	1,847,609	260,388	2,159,578	290,443	503,812	22,516	667,624	56,052	1,540,450	619,128	—51	82,005	537,071	—187,226
Kansas City Southern	827	5,322,183	1,167,640	7,210,643	695,113	879,102	216,542	2,421,977	286,649	4,499,385	2,711,258	.....	340,793	2,370,464	—122,334
Lake Erie & Western	905	3,040,857	597,448	3,870,067	629,279	804,741	117,302	1,590,055	97,843	3,239,221	630,845	.....	173,640	457,205	—445,978
Lake Shore & Michigan Southern	1,857	23,315,812	8,903,157	36,481,924	4,918,770	8,826,125	704,990	13,281,105	774,639	28,505,631	7,976,293	38,683	1,623,212	6,391,764	—6,449,546
Lehigh & Hudson River	96	1,078,468	34,896	1,176,370	205,607	189,733	11,396	467,990	33,623	908,351	268,018	.....	32,000	236,018	—139,135
Lehigh & New England	285	1,209,973	9,606	1,266,946	165,683	177,494	15,886	346,791	31,205	737,060	529,885	.....	25,745	504,140	—39,171
Lehigh Valley	1,438	21,991,826	3,303,591	26,270,293	3,075,976	4,785,810	679,925	9,455,145	588,558	18,585,416	7,684,877	208,715	1,012,000	6,464,161	—2,253,133
Long Island	398	2,156,073	5,249,717	8,300,199	1,051,270	972,580	128,583	3,665,960	220,321	6,038,716	2,261,482	—24,096	519,009	1,718,376	—385,120
Louisiana & Arkansas	272	911,277	187,256	1,135,250	212,705	166,548	19,984	292,921	42,000	734,160	401,089	.....	40,898	360,191	—217
Louisiana Railway & Navigation	350	1,059,001	201,074	1,344,881	251,527	157,467	49,992	541,059	55,120	1,055,166	289,714	.....	51,000	238,714	—63,603
Louisiana Western	207	966,075	499,419	1,540,207	158,178	330,860	59,443	495,727	52,911	1,097,120	443,087	—4,088	84,344	354,654	—86,139
Louisville & Nashville	4,923	29,398,620	9,047,883	40,981,121	6,308,853	8,288,320	874,763	13,981,128	851,869	30,304,934	10,676,187	8,424	1,350,856	9,333,754	—527,993
Louisville, Henderson & St. Louis	199	582,097	277,050	916,106	179,379	117,608	37,328	315,243	25,418	674,977	241,129	1,825	28,800	214,154	106,623
Maine Central	1,206	4,856,623	2,415,509	7,763,665	1,181,080	1,199,420	96,517	3,059,710	220,526	5,757,254	2,006,410	—27,373	389,520	1,589,516	—267,628
Michigan Central	1,799	14,530,685	6,349,280	23,138,078	3,335,666	4,214,189	518,420	10,184,478	438,145	18,690,899	4,447,179	—17,375	962,813	3,466,990	—2,620,595
Midland Valley	373	757,606	332,261	1,142,166	248,644	206,745	20,246	409,373	50,778	935,788	206,378	335	52,516	154,196	—9,434
Minneapolis & St. Louis	1,585	4,846,764	1,337,076	6,562,865	890,232	896,121	138,434	2,510,981	158,200	4,593,970	1,968,895	—299	272,536	1,696,058	—203,370
Minneapolis, St. Paul & Sault Ste. Marie	3,978	14,099,816	4,769,225	20,049,067	2,421,780	3,074,280	433,362	6,561,949	426,489	12,917,863	7,131,203	106,952	815,280	6,422,876	—2,121,826
Missouri & North Arkansas	365	542,102	292,844	887,982	221,792	160,426	29,309	354,161	45,180	810,871	77,110	.....	44,000	33,110	37,375
Missouri, Kansas & Texas	3,816	14,409,923	6,494,722	22,413,936	3,398,907	2,800,833	495,444	8,586,754	805,907	16,087,846	6,326,090	—94,040	1,026,728	5,205,321	—1,471,534
Missouri, Oklahoma & Gulf	332	636,831	173,081	842,686	169,848	137,551	44,057	390,458	58,702	800,617	42,068	3,345	48,461	—3,047	—90,100
Missouri Pacific	3,919	13,486,254	3,338,713	18,361,137	2,978,873	3,419,414	469,571	7,736,868	553,157	15,157,885	3,203,252	—27,211	770,616	2,405,423	—742,019
Mobile & Ohio	1,122	7,089,299	1,056,348	8,657,486	1,016,334	1,737,406	328,496	3,311,566	265,939	6,659,743	1,997,743	10,413	275,633	1,711,696	—246,390
Monongahela R. R.	66	950,291	22,129	988,566	127,112	58,413	3,400	205,590	17,045	411,562	577,003	.....	18,800	558,203	—101,355
Monongahela Connecting	6	.....	.....	657,325	67,883	124,044	2,400	311,470	20,078	525,877	131,447	.....	22,283	109,163	—68,714
Morgan's Louisiana & Texas	404	2,241,257	798,708	3,293,061	383,300	508,259	97,504	1,330,493	101,115	2,420,673	872,388	—12,622	195,314	664,451	238,897
Nashville, Chattanooga & St. Louis	1,231	5,880,340	2,136,379	8,635,986	1,366,307	1,651,030	342,257	3,275,035	259,007	6,893,637	1,742,348	6,906	206,780	1,528,661	—268,860
Nevada Northern	165	1,061,385	100,022	1,189,794	132,331	154,457	3,477	281,480	36,592	608,339	581,455	.....	62,013	519,441	16,601
New Orleans & Northeastern	203	2,074,571	444,325	2,711,220	272,802	586,882	81,035	1,027,085	103,753	2,071,559	639,661	—3,630	125,563	510,467	19,036
New Orleans Great Northern	282	905,863	268,981	1,275,779	174,310	134,484	21,801	370,036	61,241	761,877	513,901	—685	30,995	492,220	73,999
New Orleans, Mobile & Chicago	403	1,162,728	256,261	1,503,912	207,499	162,168	30,392	477,943	62,267	940,272	563,640	—856	60,856	501,927	34,564
New Orleans, Texas & Mexico	285	879,208	148,227	1,092,570	289,860	97,733	26,304	427,257	72,491	913,647	178,923	.....	10,545	168,377	—68,467
New York Central & Hudson River	3,752	44,499,014	23,933,392	76,790,794	11,250,542	15,457,957	1,493,579	28,965,153	1,956,849	59,124,082	17,666,712	—104,140	4,068,709	13,493,863	—4,041,927
New York, Chicago & St. Louis	565	6,678,267	1,115,575	8,065,647	1,019,676	1,251,477	393,588	3,672,995	151,811	6,489,549	1,576,098	—22,637	313,213	1,240,247	—1,022,027
New York, New Haven & Hartford	2,066	21,364,945	18,633,350	44,490,191	5,654,184	6,791,475	330,184	18,300,936	1,206,459	32,283,242	12,206,949	66,198	2,410,000	9,863,147	—3,789,134
New York, Ontario & Western	565	4,515,661	1,267,750	6,092,462	915,473	1,087,496	82,282	2,332,998	133,858	4,552,109	1,540,353	—17,402	151,300	1,371,650	—548,999
New York, Philadelphia & Norfolk	112	1,989,070	361,529	2,528,228	219,881	558,840	41,254	1,152,128	111,177	2,080,283	447,944	.....	68,400	379,544	—164,941
New York, Susquehanna & Western	149	1,367,088	372,165	1,954,077	243,593	249,898	18,933	829,097	58,214	1,399,737	554,339	—20,901	119,457	413,980	—12,026

REVENUES AND EXPENSES OF RAILWAYS

EIGHT MONTHS ENDING FEBRUARY 28, 1914—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total. inc. misc.	Maintenance: Way and structures.	Maintenance: Of equipment.	Traffic.	Transportation.	General.	Total.					
Norfolk & Western	2,035	$25,366,263	$3,390,562	$29,835,620	$3,437,023	$6,212,474	$491,072	$9,566,776	$611,701	$20,319,047	$9,516,573	—$13,586	$1,060,000	$8,442,986	—$1,309,081
Norfolk Southern	834	1,735,317	662,323	2,609,783	358,241	351,460	46,746	909,504	139,012	1,804,964	804,819	6,762	83,061	728,519	—99,348
Northern Central	472	6,543,600	1,731,254	8,887,497	1,117,690	2,044,402	141,730	4,442,470	220,857	7,967,152	920,345	5,286	337,542	588,088	—639,301
Northern Pacific	6,312	33,727,458	10,988,898	47,720,549	6,241,685	5,777,719	839,370	15,350,055	722,068	28,930,899	18,789,650	289,164	3,135,176	15,943,638	—2,156,006
Northwestern Pacific	400	999,006	1,317,728	2,503,993	406,765	324,194	31,310	906,131	95,138	1,763,539	740,454	.....	120,800	619,654	—74,838
Oregon Short Line	2,042	10,965,688	3,397,245	15,355,684	1,816,164	1,901,436	291,668	3,891,036	432,387	8,332,692	7,022,991	—18,633	1,068,074	5,936,283	—814,343
Oregon-Washington R. R. & Navigation	1,914	7,732,532	3,389,519	11,988,963	1,709,422	1,423,626	403,480	4,178,912	479,389	8,194,832	3,794,131	—40,790	898,524	2,854,817	—560,068
Pecos & Northern	481	1,225,073	318,484	1,633,922	171,577	290,687	22,677	505,297	54,033	1,044,273	589,649	.....	61,419	528,229	—15,204
Pennsylvania Co.	1,749	31,356,589	6,942,922	42,490,231	6,008,172	8,056,822	715,799	16,247,089	929,915	31,957,798	10,532,432	—87,501	2,184,297	8,260,633	—2,626,609
Pennsylvania R. R.	4,043	87,132,901	25,864,665	121,780,272	16,026,397	25,525,467	1,748,071	45,832,472	2,995,729	92,128,138	29,652,134	—1,278,455	4,963,371	23,410,307	—3,321,340
Pere Marquette	2,324	7,383,804	2,804,229	11,191,000	1,736,698	2,677,683	274,999	4,907,121	334,290	9,930,794	1,260,206	—30,785	408,046	821,374	—1,458,872
Philadelphia & Reading	1,020	25,363,478	4,814,965	31,670,068	3,201,930	5,820,537	352,220	10,871,402	510,126	20,756,216	10,913,851	162,029	821,614	10,254,267	—3,396,168
Philadelphia, Baltimore & Washington	717	6,710,270	5,650,709	13,810,810	2,209,780	2,618,143	273,172	6,164,593	374,637	11,635,326	2,175,483	.....	438,027	1,737,455	—659,649
Pittsburgh & Lake Erie	224	10,322,986	1,249,561	12,001,504	1,273,102	2,519,072	130,964	3,137,628	237,247	7,298,015	4,703,489	—3,722	475,885	4,223,881	—2,251,720
Pittsburgh, Cincinnati, Chic. & St. Louis	1,472	19,795,459	6,073,244	29,176,993	4,350,354	5,908,590	598,976	11,603,011	622,513	23,083,446	6,093,547	—5,269	1,273,669	4,814,608	—2,158,525
Pittsburgh, Shawmut & Northern	282	1,416,351	87,529	1,524,573	300,137	403,633	13,797	543,625	41,470	1,302,664	221,909	.....	14,650	207,258	—151,612
Port Reading	21	846,293	.....	861,618	109,736	886	312	284,261	3,439	398,637	462,980	24,586	98,000	389,567	—317,979
Richmond, Fredericksburg & Potomac	87	947,319	675,873	1,857,477	188,935	221,901	25,882	718,938	58,723	1,214,381	643,095	—11,652	65,779	565,663	—116,172
Rutland	468	1,314,172	879,131	2,535,987	290,292	478,659	74,651	995,042	50,921	1,889,566	646,421	496	137,862	509,055	20,128
St. Joseph & Grand Island	318	770,677	243,913	1,105,057	203,425	167,572	40,029	475,711	49,668	936,407	168,649	64	58,288	110,426	11,353
St. Louis & San Francisco	4,741	16,914,946	7,484,392	29,436,373	4,562,418	4,818,877	580,335	9,918,733	809,939	20,690,303	8,746,069	.....	966,169	7,779,900	—1,586,531
St. Louis, Brownsville & Mexico	517	1,001,890	582,756	1,733,302	405,351	192,513	38,389	658,467	86,720	1,381,442	351,859	.....	62,728	289,130	—40,465
St. Louis, Iron Mountain & Southern	3,364	16,847,433	4,349,079	22,776,641	3,068,389	3,525,296	434,097	6,861,967	588,552	14,478,303	8,298,338	—19,411	835,686	7,443,239	470,986
St. Louis Merchants' Bridge Terminal Ry.	9	.....	2,921	1,319,559	263,380	87,704	5,876	710,165	48,388	1,115,515	204,043	.....	48,150	155,893	—148,682
St. Louis, San Francisco & Texas Ry	243	771,849	269,214	1,105,585	210,425	158,799	18,348	439,629	45,042	872,246	233,339	.....	12,463	220,875	—48,899
St. Louis Southwestern	914	4,385,049	1,032,149	5,734,843	535,542	1,037,629	236,098	1,416,572	223,862	3,449,705	2,285,137	—10,810	253,389	2,020,938	—381,267
St. Louis Southwestern Ry. Co. of Texas	810	2,198,188	895,736	3,330,844	764,333	787,787	10,931	1,339,670	16,734	3,168,456	162,387	—2,084	150,261	10,041	—430,501
San Antonio & Aransas Pass	724	2,269,769	964,011	3,417,915	709,792	502,004	51,216	1,313,250	94,716	2,670,980	746,934	.....	108,000	638,934	—474,087
San Pedro, Los Angeles & Salt Lake	1,133	4,355,049	2,048,907	6,912,821	816,461	1,173,278	253,459	2,346,531	147,396	4,737,127	2,175,694	—22,802	326,606	1,826,284	—243,735
Seaboard Air Line	3,081	11,299,075	3,644,085	16,606,310	2,139,540	2,251,169	526,913	6,104,278	492,772	11,514,673	5,091,636	—11,205	656,000	4,424,431	237,317
Southern Kansas Ry. Co. of Texas	179	702,599	127,827	870,181	107,159	170,091	12,683	270,943	29,360	590,238	279,942	.....	31,086	248,856	—126,916
Southern Pacific	6,389	36,558,085	20,379,712	61,632,240	7,007,761	8,754,069	1,270,777	17,710,613	1,874,860	36,618,082	25,014,158	850,272	3,356,741	22,507,688	—3,548,469
Southern Ry.	7,036	30,433,838	13,108,131	47,217,025	6,147,762	7,845,782	1,473,994	16,544,905	1,418,251	33,430,695	13,786,329	36,730	1,755,986	12,067,073	—539,675
Southern Ry. Co. in Mississippi	280	545,661	315,585	934,157	201,983	84,278	19,233	375,756	32,461	713,713	220,444	.....	69,863	150,580	92,942
Spokane International	163	509,423	164,609	703,885	105,708	42,618	15,633	211,099	29,954	405,015	298,870	.....	29,151	269,718	—22,686
Spokane, Portland & Seattle	556	1,971,987	1,110,966	3,361,850	482,630	304,622	64,359	845,600	106,698	1,803,910	1,557,939	857	427,200	1,131,597	—323,870
Tennessee Central	293	777,021	299,352	1,142,364	216,108	132,713	45,519	401,604	58,356	854,302	288,061	.....	33,980	254,081	12,625
Terminal R. R. Association of St. Louis	33	.....	1,655	1,924,716	309,374	149,727	7,438	763,793	46,443	1,276,776	647,939	56,847	226,965	477,822	—168,750
Texas & New Orleans	458	1,804,717	855,344	2,844,257	480,903	651,188	68,762	1,167,817	105,528	2,474,000	370,256	9,396	156,202	223,451	—55,279
Texas & Pacific	1,884	8,963,203	3,292,912	13,151,819	1,538,033	1,973,967	301,836	5,465,040	345,908	9,624,786	3,527,032	—26,882	482,540	3,017,609	650,618
Toledo & Ohio Central	443	3,325,458	461,073	4,006,180	719,094	820,761	65,344	1,595,257	83,657	3,284,115	722,065	—4,331	168,935	548,798	—381,485
Toledo, Peoria & Western	247	506,718	343,670	905,146	178,562	232,200	19,443	400,674	29,438	860,319	44,827	.....	47,200	2,372	—165,496
Toledo, St. Louis & Western	450	2,684,502	254,822	3,129,165	324,001	420,980	130,564	1,164,640	73,904	2,114,091	1,015,073	.....	130,800	884,273	48,734
Trinity & Brazos Valley	462	1,316,697	392,747	1,782,380	434,834	247,525	82,356	834,759	99,668	1,699,143	83,237	.....	46,567	36,670	—332,068
Ulster & Delaware	128	424,033	261,765	724,579	101,600	102,338	11,386	324,040	30,632	569,998	154,580	535	28,000	127,115	—57,910
Union R. R. of Pennsylvania	31	.....	.....	2,948,314	400,160	802,001	812	1,288,133	35,403	2,526,511	421,803	32,161	74,500	379,465	—555,067
Union R. R. of Baltimore	9	901,629	184,846	1,102,267	115,333	.....	7,621	39,836	20,758	183,549	918,718	.....	46,940	871,777	—112,780
Union Pacific	3,612	25,019,576	7,295,650	35,665,614	3,592,350	4,898,346	845,642	9,585,697	1,006,147	19,928,184	15,737,430	—80,033	1,506,169	14,151,227	—1,356,159
Vandalia	910	5,274,273	1,723,880	7,834,505	964,085	1,493,786	214,657	3,099,146	164,675	5,936,351	1,898,154	.....	252,464	1,645,689	—193,370
Vicksburg, Shreveport & Pacific	171	718,773	410,565	1,231,583	199,051	237,831	28,411	416,419	42,374	924,089	307,494	—1,913	55,061	250,519	11,243
Virginia & Southwestern	240	1,143,536	127,950	1,308,410	178,887	314,259	17,275	374,070	31,752	916,245	392,165	.....	50,108	342,056	23,736
Virginian Railway	503	3,928,751	264,960	4,306,135	550,041	688,323	44,394	1,009,709	79,949	2,372,417	1,933,717	56,076	175,445	1,814,348	290,906
Wabash R. R.	2,514	13,799,500	5,029,308	20,634,172	2,518,982	3,813,387	701,885	8,596,821	567,414	16,198,491	4,435,680	—38,615	647,543	3,749,522	—837,788
Washington Southern	35	285,739	333,319	826,342	111,508	117,355	11,136	342,210	25,117	607,329	219,013	—1,308	27,963	189,741	—47,416
West Jersey & Seashore	355	1,201,867	2,924,761	4,408,539	696,472	716,926	138,963	1,895,167	108,511	3,556,040	852,499	—27,747	209,017	615,734	—282,078
Western Maryland	661	4,570,131	733,106	5,541,807	1,015,526	1,075,526	186,705	2,625,564	161,678	5,065,001	476,805	.....	173,100	303,705	—717,252
Western Pacific	937	3,322,835	829,949	4,265,391	908,032	524,000	227,030	1,574,836	211,082	3,444,983	820,408	—17,404	261,126	541,877	—430,074
Western Railway of Alabama	133	573,716	379,522	1,030,743	176,412	198,252	49,774	286,379	46,855	757,674	273,068	432	39,641	233,860	—5,905
Wheeling & Lake Erie	459	4,760,111	439,979	5,511,197	761,901	956,853	69,705	1,853,314	144,026	3,785,801	1,725,395	—882	249,482	1,475,031	—84,933
Yazoo & Mississippi Valley	1,371	6,298,513	2,075,705	8,930,234	1,199,763	1,218,041	124,233	3,173,887	220,138	5,936,065	2,994,168	2,400	354,500	2,637,267	1,187,849

Traffic News

The Southern Classification Committee has announced that its next meeting will be held at the St. Charles hotel, Atlantic City, N. J., on July 6.

The schedule of the "Hoosier Limited" on the Chicago, Indianapolis & Louisville was changed on May 3. The train now leaves Chicago at 5:30 p. m., and reaches Indianapolis at 11 p. m.

The first passenger train run through from Quebec to Toronto, over the Canadian Northern, arrived in Toronto on the night of April 30. It was a special train, composed of 12 cars, carrying 800 emigrants. The larger part of the emigrants went on further west by the Canadian Pacific.

The Official Classification Committee has issued a circular announcing its plan for hearings on proposed classification changes. Formal requests for changes in the provisions of the classification are considered by the committee at its regular meetings, and for the information of the public these requests for changes are published in printed dockets with a complete index of the subjects to be considered. The circular states that these dockets will hereafter be issued quarterly and will be mailed to docket subscribers prior to the public hearings of the committee, and as promptly after the closing date of the docket as possible. Meetings of the committee and hearings for the public will be scheduled for dates early in the months of March, June, September and December, and subjects to be considered at the respective meetings will be docketed if received by the chairman not later than the first day of February, May, August and November. Frequent reissues of the classification, followed by the necessary supplement, will be made as heretofore.

The American Railway Association has issued a circular regarding its action towards roads involved in the decision of the Interstate Commerce Commission in the Industrial Railways case. On February 19 the association issued a circular announcing the suspension of certain roads from the per diem rules agreement as of March 1. Since that time the Interstate Commerce Commission has suspended the tariffs canceling the allowances to certain of these roads, and on the recommendation of the Committee on Relations between Railroads, and pending further action by the commission, the executive committee has restored to the per diem rules agreement as of March 1, the following roads: Chicago & Illinois Western, Chicago Short Line, Illinois Northern, Illinois Terminal, Pullman, Susquehanna & New York. The circular states that if the commission should vacate, as of a certain date, the orders suspending the cancellation of the allowance to any of these roads, its standing under the per diem rules agreement will terminate on the same date. The circular also announces the suspension from the per diem rules agreement of the St. Louis, Troy & Eastern, as of May 1, and until such time as it may be declared eligible by the Interstate Commerce Commission, when further action may be taken.

A LONG RAILWAY TUNNEL IN NORWAY.—On the railway line from the heart of the city of Bergen to the summit of Mount Floien, there will be a tunnel connecting the railway terminal with the harbor, approximately 1.86 miles long.

PROTECTING THE BRITISH ROYAL TRAIN.—Very great care is taken to safeguard the line of an English railway during the passage of the royal train. The arrangements for running the train are exactly the same on all lines and have been so for several years. Some companies run a pilot engine ten minutes in advance, while others arrange that the royal special shall follow an ordinary express, the latter acting as the pilot. The "line clear" signal for the train is obtained earlier than usual, and thereafter until the special has passed, no switching is permitted on adjacent tracks. Freight trains are not allowed to pass in the opposite direction at all, but passenger trains may do so at reduced speed. All switches are locked and the line is policed by track men who stand within sight of each other. The police authorities also arrange for an officer to be on every bridge.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended from April 26 to August 13 certain schedules in a Chicago, Indianapolis & Louisville tariff, increasing rates from interstate points to certain Mississippi river crossings.

The commission has suspended from April 27 to July 30 a Missouri, Kansas & Texas tariff, increasing rates on cement in carloads from Humboldt, Chanute and other points in Kansas to Minneapolis, Minn., and other interstate points.

The commission has suspended from April 27 to August 25 certain schedules in an Illinois Central tariff, increasing rates on lumber other than pine and gum, in carloads from Grenada, Miss., and other southern points to New Albany, Ind.

The commission has suspended until July 30, certain schedules in tariffs of the Denver & Rio Grande, the Kanawha & West Virginia, the Ohio Electric, the Toledo & Ohio Central and the Toledo, St. Louis & Western, canceling through joint rates to and from points on the Chicago & Illinois Western and certain other small lines.

Shipments of Goods in Fiber Packages

R. W. Pridham Company v. Southern Pacific et al. Opinion by Commissioner McChord:

Complainant, a paper box manufacturer at Los Angeles, attacks as unreasonable an arrangement whereby articles moving from California terminals in boxes "made entirely of wood or wood and metal" are given commodity rates while similar articles shipped in fiber boxes are made to pay class rates which are in some instances 400 per cent. higher. Fiber packages are covered by a rule, uniform except for minor variations in phraseology in the three principal classifications, the substance of which is that ratings on articles in wooden boxes will apply on the same articles in fiber board, pulp board, or double-faced corrugated strawboard boxes, with or without wooden frames, provided certain requirements and specifications are complied with; otherwise the rates on articles in fiber will be increased 20 per cent. The rule sets forth specifications as to the thickness and strength of the fiber board, the dimensions and weight limits of the package, and the manner in which it must be packed and sealed. For the heaviest type of fiber board prescribed the weight limit is 90 lb. No departure from this rule is made in any commodity tariff except the one naming commodity rates eastbound from California terminals. In that tariff the commodity rates on articles packed in boxes apply only on boxes "made entirely of wood or wood and metal completely enclosing the contents," thus precluding the application of commodity rates to shipments in fiber boxes, leaving only the class rates to be charged upon goods in such containers. Prior to August 19, 1912, rates were named on olives and olive oil "in packages" which permitted their shipment in fiber boxes. With this exception the defendants have never extended commodity rates to articles shipped eastbound in fiber packages. The same carriers do apply commodity rates on articles so packed and moving westbound. From north Pacific coast points there is only the usual classification restriction on the fiber package moving either east or west under commodity rates. The complainant has for some time been making efforts to have fiber packages included in the tariff description of boxes. The western carriers have not been hostile, but have felt constrained to yield to the influence of the lumber interests, whose tonnage from the Pacific coast is no mean item. The complainant sought only to have incorporated in the eastbound commodity tariff a rule similar to that carried in all of the classifications. The fiber box manufacturers lent their aid and sought at least to retain the existing rules obtaining in other territories. The lumber and wooden box interests, which also intervened, not only opposed the complaint, but attempted to show why the existing classification rules should be amended so as to practically eliminate the fiber package as a shipping container. As a result, the case has been so presented that the record contains all available information respecting the relative merits of the wood and the

fiber package as containers of freight transported throughout the United States. Testimony was offered by both fiber and wooden box manufacturers, by shippers using both containers and by freight handlers who load and unload both packages. From this testimony, the commission concludes that for many commodities the fiber box constructed, packed and sealed in accordance with the present classification rules will carry as well as the wooden package. Recognizing, then, no transportation difference between the movement of suitable commodities from the Pacific coast eastbound in wood and fiber, defendant's rule limiting the term "boxes" to those constructed entirely of wood or of wood and metal is found unjustly discriminatory. Comparing that rule with the rules obtaining in western, official and southern classifications, and with the rules applicable to commodities westbound and to commodities eastbound from the north Pacific coast terminals and considering the carrying qualities of the fiber box as above found, it also finds that defendant's rule is unreasonable. None of the carriers prescribe any specifications for wooden boxes, and under existing practices any package made of wood completely enclosing the contents, be it only one-sixteenth inch veneer, is regarded as a box. The commission believes that shippers and railroads should look into this matter with the end in view of placing some restrictions on insecure wooden packages. The commission finds it to be both inadvisable and impossible for it to indicate what articles should not be accepted for transportation in fiber boxes, but it is convinced of the necessity for the elimination of some of the commodities now carried. It is also held that the classification rules with respect to the construction, packing and sealing of fiber boxes should be rigidly enforced and the shipper held responsible for any violation therof. (30 I. C. C., 117.)

STATE COMMISSIONS

The Illinois Public Utilities Commission has issued a docket of petitions for additions and changes in the Illinois Commissioners' Classification for consideration and action at a meeting to be held at Chicago on May 13.

The California railroad commission has issued a report of its findings in an investigation of the rules, regulations and practices of the Pullman Company and directs the company to remedy within 30 days numerous conditions which it specifies. The commission, in discussing 10 separate subjects of complaint, lays the greatest emphasis upon the inattention of employees and severely criticizes the company for paying its porters such low wages that they are forced to depend upon tips.

PERSONNEL OF COMMISSIONS

Frank T. Oakley, bridge engineer of the Northwestern Pacific at San Francisco, Cal., has been appointed senior structural engineer of the Pacific district, division of valuation, Interstate Commerce Commission, with headquarters at San Francisco, Cal.

COURT NEWS

The Missouri Southern has applied to the Missouri Supreme Court for an order requiring the Missouri Public Service Commission to fix higher freight and passenger rates for this road than are provided by statute.

The Wisconsin Supreme Court has ordered the Northern Pacific to file with the secretary of state a copy of the resolutions of its directors increasing the capital stock by $95,000,000. This is in a suit by the state to recover $95,000 in fees for filing a record of the increase in capital.

On April 28 in the district court for the western district of Michigan, the Ann Arbor entered a plea of guilty to an indictment charging the granting of concessions on shipments of packinghouse products from Chicago to local stations on the Ann Arbor, and the Saginaw Beef Company pleaded guilty to accepting concessions connected with the same shipments. Each defendant was fined $8,000. The concessions charged involved the shipment of packinghouse products from Swift & Co., from Chicago in carload lots, which were peddled along the line of the Ann Arbor by a representative of the Saginaw Beef Company. The freight was prepaid on the basis of carload rates, making a considerable saving under the less than carload rates. An indictment against Swift & Co. for its part in the transaction was returned in the northern district of Illinois and is still pending.

The Federal Court at Jackson, Miss.—Judges Niles, Grubbs and Shelby—has handed down a decision sustaining the Mississippi Railroad Commission in its action increasng the taxes of the Illinois Central and the Yazoo & Mississippi Valley railroads. The railroad companies sought to enjoin the collection of taxes imposed by the commission for 1913, the commission having increased the assessments over the previous year for ad valorem taxes more than a million dollars. The injunction was argued at Birmingham six months ago. The court holds that the assessments, while heavy, were not more so than is imposed on other property in the state and therefore must stand. But it is held that the privilege tax of $45 per mile was unconstitutional, null and void, and all the railroads in the state will refuse to pay it; and will try to recover the hundreds of thousands of dollars already paid the state on that score. The state will appeal that part of the decision. The privilege taxes imposed amount to $107,500, but the sum to be collected on ad valorem taxes, with damage, amounts to several times that sum.

In the United States district court at Newark, N. J., May 6, Judge Rellstab imposed a fine of $10,000 on the Lehigh & Hudson River Railroad for its violation of the Interstate Commerce act in the transportation of coal for its own use, as recently reported. The company withdrew its plea of not guilty and entered pleas of non vult to each of the ten indictments, with the understanding that an indictment found against Morris Rutherford, an officer of the road, would be nolle prossed. The company had shipped coal from Westmoreland, near Pittsburgh, to Phillipsburg, N. J., on the understanding that it was going through to Warwick, N. Y. It was carried over the Pennsylvania Railroad at the proportion of the through rate, $1.75 a ton. At Phillipsburg the understanding was that the Lehigh & Hudson was to carry the coal over its own line to Warwick. This was not done, the coal being left at Phillipsburg for its own use, thus taking advantage of the through rate. Shipped under the local rate, it would have been $2 a ton. The Lehigh & Hudson has paid to the Pennsylvania Railroad $2,000 due to it under the local rate.

The Cotton-Bill Frauds

The United States Circuit Court of Appeals, at New Orleans, April 28, affirmed the decision of the lower court, holding that the Louisville & Nashville is not liable for the sum of $70,820, sued for by Alexander Eccles & Co., cotton merchants, of Liverpool, this being the sum lost by Messrs. Eccles in buying forged bills of lading purporting to represent cotton shipped from Alabama to England. The suit was begun in February, 1911, and was an outcome of the extensive Knight-Yancey frauds in connection with bills of lading.

Eccles & Co. sought to hold the railroad liable because, during the time from 1905 until the failure of Knight, Yancey & Co. in April, 1910, other forged bills of lading of the same character had been used under like circumstances, on which other consignees had made advances. Through the connivance of agents of the railroad, deliveries were allowed to be made upon such forged bills, whereby, it is contended, the railroad, by its course of deliveries under forged and irregular bills of lading, had held out all forged bills as genuine.

On the trial before the jury there was evidence tending to show that, after a bill of lading had been forged and used as collateral for foreign drafts, the alleged forger, Knight, Yancey & Co., having delivered to the carrier cotton of the same quantity, weights, numbers, marks, etc., obtained true bills of lading substantially identical with the forged bills, and thereafter the true bills being suppressed, delivery was allowed to be made upon such forged bills, all with more or less knowledge on the part of the carrier. It was claimed that this gigantic fraudulent scheme could not possibly have continued for so long a period without the connivance of the company; while yet it not only took no step to break up the scheme, but afforded such assistance as was essential to its continuance, and profited greatly thereby.

The court of appeals says:

"We doubt if there was sufficient evidence to warrant the submission of the case to the jury, but as it was submitted under

instructions in which we find no reversible error, and as we find no error in any of the rulings admitting or rejecting evidence, the judgment of the district court is affirmed."

Southern Pacific Answer in Central Pacific Dissolution Suit

The Southern Pacific on April 30 filed in the United States district court for the district of Utah its answer in the government suit to divorce the Central Pacific from the Southern Pacific. The answer, after specifically denying all allegations that the Sherman anti-trust law had been violated, points out not only that the two lines were originally built, operated and developed as one road, but that, as far back as 1898, the United States government, itself, practically recognized the combination as wholesome. It shows, furthermore, that in the joint operation of these lines, through trains have been run by the most direct or convenient route without reference to their ownership, and that any separation of the Central Pacific lines from those of the Southern Pacific cannot now be had without detriment to both properties, and without impairing and inconveniencing the public service and the communities through which the lines pass.

In a brief historical resume, these facts are brought out:

That the lines of the Southern Pacific were built as extensions and connections of the lines of the Central Pacific, and by the same stockholders.

That, as the lines of the Southern Pacific were completed, they were directly leased to the Central Pacific to be operated as a unit with its lines.

That, on April 1, 1885, the Southern Pacific, to simplify the organization, took over, under lease for 99 years, all the lines of both Central Pacific and Southern Pacific; and has since managed and developed them as one property, considering only efficiency of service to the public, without regard to corporate properties, such as terminals and branches.

That, relying on the terms under which the Central Pacific's debt to the government of $58,000,000 was settled in 1898, the Southern Pacific undertook heavy financial obligations, not only guaranteeing the payment of this debt, but also guaranteeing the $100,000,000 four per cent. mortgage bond issue of the Central Pacific. In this connection, it is contended that the government could not consistently and with justice have accepted this settlement, of which it did have full knowledge as party thereto, if the arrangement involved a relation between the roads contrary to public policy.

That, even as late as 1912, in the recent so-called Harriman merger suit, when the United States Supreme Court ordered the dissolution of the Union Pacific and the Southern Pacific, the court found no reason to disturb the relations between the Central Pacific and the Southern Pacific. The Supreme Court ordered the dissolution of the Union from the Southern Pacific, but as to the Central-Southern Pacific relations, said, "We find no reason to disturb the action of the court below." The court below had declined to disturb the Central-Southern Pacific relations, although the facts concerning it were at the time brought out.

Commenting on the fact that the lines were in one ownership and management and developed as one property, the early part of the answer points out that, because of this fact, little heed was given as to which corporation should hold the title to terminal properties and branch lines. Accordingly branch lines from points on the Central Pacific were built and owned by the Southern Pacific, these branches having no connection with the main line of the Southern Pacific except through Central Pacific lines. At important points the entire title to valuable terminal properties was taken and held in the name of the Central Pacific. At other points the title to terminal properties was held by the Southern Pacific.

Any separation of the Central Pacific lines from the Southern Pacific lines cannot now be had except with great detriment and injury to each of these companies, and in order that these lines should now be operated as separate properties, there must be expended very large sums of money to secure separate terminals to complete these properties for operation on a basis independent of each other. Besides, such separation would necessarily impair the public service, as through direct routes could not be used as efficiently or economically for operation of trains by one company as under present conditions.

Railway Officers

Executive, Financial, Legal and Accounting

R. Budd, chief engineer of the Great Northern, has been appointed assistant to the president, with office at St. Paul, Minn., effective May 1.

Judge George Thompson, of Ft. Worth, Tex., has been appointed general attorney of the Texas & Pacific for Texas, succeeding W. L. Hall, deceased.

Benjamin Campbell, vice-president in charge of traffic of the New York, New Haven & Hartford and the Boston & Maine, has resigned as vice-president of the Boston & Maine.

R. E. Kimbell, assistant general auditor of the St. Louis Southwestern, has been appointed assistant to the president, with headquarters at St. Louis, Mo., succeeding C. W. Nelson, promoted. Mr. Kimbell was born January 19, 1867, at Little Rock, Ark., and was educated in the public schools. He began railway work in 1886 as junior clerk in the auditor's office of the St. Louis, Arkansas & Texas, now the St. Louis Southwestern. He filled various clerkships, was traveling auditor and chief clerk in the accounting department, until December, 1902, when he was made assistant general auditor of that road, from which position he is now promoted to that of assistant to the president, as above noted. In December, 1909, he was also appointed auditor of the Memphis Union Station Company.

R. E. Kimbell

Charlton Messick, freight and passenger accountant of the St. Louis Southwestern, has been appointed assistant general auditor, with headquarters at St. Louis, Mo., to succeed R. E. Kimbell, promoted. Mr. Messick was born at Louisville, Ky., August 22, 1870. He attended public school in the latter city and spent one year at private school preparing for Yale University, but upon his father's removal to St. Louis, he attended Smith Academy in that city for one year until October, 1888. He then began railway work at the age of 18 years with the St. Louis Southwestern, in whose service he has remained ever since. He started in the accounting department in a junior clerkship, and with the exception of a few months in 1890 he has been continuously employed in the same department in various capacities up to the present time, covering a period of twenty-five years.

C. Messick

Thomas C. McCampbell, chief clerk to the auditor of the Tennessee, Kentucky & Northern, has been appointed general auditor and claim agent, with headquarters at Nashville, Tenn.

The election of William G. Besler, vice-president and general manager of the Central of New Jersey, with office at New York, as president and general manager of that company, succeeding George F. Baer, deceased, is commented on elsewhere in this issue.

Operating

Harry Decatur Mudgett has been appointed trainmaster of the Northern Pacific at Livingston, Mont., in place of W. E. Berner, promoted.

O. E. Slater, trainmaster of the Fort Dodge, Des Moines & Southern at Boone, Iowa, has been appointed superintendent of terminals at Fort Dodge, Iowa, and the former position is abolished, effective May 1.

A. B. Kearsey, auditor and traffic manager of the Pascagoula Moss Point Northern, at Moss Point, Miss., has been appointed general manager, with headquarters at Moss Point, succeeding Stewart Starr, resigned.

R. F. Carr, superintendent of the St. Louis, Brownsville & Mexico at Kingsville, Tex., has been appointed superintendent of the Southeastern division of the St. Louis & San Francisco, with headquarters at Birmingham, Ala., succeeding J. H. Doughty, acting superintendent, who resumes his former duties as general agent.

E. W. Deuel, assistant superintendent of the Fourth division of the Denver & Rio Grande at Alamosa, Colo., has been appointed superintendent of the Third division, with headquarters at Gunnison, Colo., succeeding R. C. Ten Eyck, who has been appointed superintendent of the Grand River division, with office at Helper, Utah, succeeding N. A. Williams, resigned, and C. B. Carpenter, inspector of transportation at Denver, Colo., has been appointed assistant superintendent of the Fourth division, with headquarters at Alamosa, Colo., succeeding Mr. Deuel, effective May 1.

Samuel C. Stickney, assistant to president of the Erie, has been appointed assistant general manager of the Erie and subsidiary companies, with headquarters at New York. He was born in 1865, in Minnesota, and was educated at the Massachusetts Institute of Technology. He began railway work in Minnesota as a rodman on location and construction. He was then for one year—1886—locating engineer in Iowa on the Chicago, St. Paul & Kansas City, now the Chicago Great Western. In 1887 he was appointed superintendent of construction in Illinois, and from 1888 to 1890 was engineer of maintenance of way of the same road. He went to the Chicago Union Transfer Railway in 1890 as chief engineer. From 1892 to 1894 he was assistant to president of the Chicago Great Western, and from 1894 to 1909 was first general manager and then vice-president and general manager of the same road. He entered the service of the Erie in 1909, and in March, 1913, was appointed assistant to president, which position he held at the time of his recent appointment as assistant general manager of the same road, as above noted.

Traffic

M. Hartman has been appointed general agent of the United Fruit Company at Chicago.

W. H. Townsend has been appointed commercial agent of the St. Louis Southwestern at Pittsburgh, Pa., in place of J. C. Toynbee, resigned.

J. D. Watson has been appointed assistant freight traffic manager of the St. Louis Southwestern, with headquarters at St. Louis, Mo., effective May 1.

C. J. Brister, general freight agent of the Cleveland, Cincinnati, Chicago & St. Louis, has been appointed traffic manager, with headquarters at Cincinnati, Ohio.

The title of John A. Streyer, general freight and passenger agent of the Macon, Dublin & Savannah, with office at Macon, Ga., has been changed to traffic manager.

E. F. McDaneld, traveling freight agent of the Chicago & Alton, with headquarters at Salt Lake City, Utah, has been appointed general agent of the freight department at that place, succeeding H. W. Prickett, resigned.

S. W. Greaves, assistant auditor of the St. Louis Southwestern of Texas at Tyler, Tex., has been appointed freight and passenger accountant of the St. Louis Southwestern, with headquarters at St. Louis, Mo., succeeding Charlton Messick, promoted.

C. T. Cope, traveling freight agent of the Southern Railway at Rome, Ga., has been appointed assistant commercial agent, with headquarters at Rome, and H. A. Platt has been appointed traveling freight agent, with office at Rome, succeeding Mr. Cope.

E. T. Campbell, traffic manager of the Erie, has been appointed general traffic manager, with headquarters at Chicago, and David L. Gray, assistant freight traffic manager at New York, has been appointed assistant general traffic manager, with headquarters at New York, effective May 1.

C. B. Lindsay, traveling freight agent of the Missouri Pacific, St. Louis, Iron Mountain & Southern, Denver & Rio Grande and Western Pacific, with headquarters at Little Rock, Ark., has been appointed commercial agent for those roads at Pine Bluff, Ark., to succeed H. N. Atwood, transferred.

W. M. Lampton, whose appointment as general freight agent of the Denver & Rio Grande, with headquarters at Denver, Colo., has already been announced in these columns, was born September 2, 1863, and was graduated from Westminster College in 1881. He began railway work in 1882 as traveling auditor of the Texas & Pacific, where he remained until 1885, when he resigned to engage in mercantile business at Fort Worth, Tex. In October, 1892, he re-entered railway service with the Denver & Rio Grande as claim clerk, and in July of the following year he was made chief clerk in the general freight office. Mr. Lampton was promoted to general agent of the freight department in February, 1898, and was appointed assistant general freight agent in November, 1899, from which position he was promoted to that of general freight agent, as above noted, on May 1.

W. M. Lampton

Engineering and Rolling Stock

A. H. Hogeland, consulting engineer of the Great Northern, has been appointed chief engineer, with headquarters at St. Paul, Minn., succeeding R. Budd, promoted.

E. L. Crugar, until recently assistant chief engineer of the Chicago & Alton at Chicago, has been appointed assistant engineer of the Illinois Central, with headquarters at Chicago.

I. C. Brower, until recently division engineer of the Chicago & Alton at Bloomington, Ill., has been appointed assistant engineer of the Chicago, St. Paul, Minneapolis & Omaha, with office at St. Paul, Minn.

A. K. Shurtleff has resigned as office engineer of the Chicago, Rock Island & Pacific to become engineer for the western group of the presidents' conference committee on valuation, with office in the Burlington building, Chicago.

A. C. Hinckley, master mechanic of the Southern Pacific at Oakland Pier, Cal., has been appointed superintendent of motive power and machinery of the Oregon Short Line, with headquarters at Salt Lake City, Utah, succeeding J. F. Dunn, who resigns on account of ill health.

Special

D. R. McLennan, supervisor of the insurance fund of the Rock Island Lines, having resigned, effective May 1, the position is

abolished, and Paul Hevener has been appointed superintendent of the insurance department, with headquarters at Chicago.

OBITUARY

Hersey B. Goodwin, who was a railroad commissioner for Massachusetts from 1896 to 1901, and first president of the Boston Chamber of Commerce, died on May 6, in Cambridge, Mass., at the age of 78.

Joseph Lomax, who was president of the Grand Rapids & Indiana from 1854 to 1866, died at his home in Indianapolis, Ind., on April 26, aged 104 years. Some years after resigning the presidency Mr. Lomax entered the treasury department of the company, where he remained until about 14 years ago.

Abraham Vedder Hartwell, president of the F. G. Hartwell Coal Company, and formerly purchasing agent of the Chicago & Alton, died in Chicago on May 5. He was born at Denmark, N. Y., and entered railway service in 1863 as fuel agent of the Chicago & Alton. During the following two years he was engaged in the construction of that road, and from 1865 to January 1, 1900, was purchasing agent of the same road, and then resigned to engage in the coal business.

Former Judge John Forrest Dillon, consulting counsel of the Western Union Telegraph Company, and formerly general counsel of the Missouri Pacific, died at his home in New York City on May 5. He was born on December 25, 1831, in Montgomery county, N. Y., and was appointed general counsel of the Union Pacific in 1879, which position he held for many years. He also became general counsel for the Missouri Pacific and the Texas & Pacific and consulting counsel for the Manhattan Elevated Railway Company of New York City. Previous to taking up railway work he served for many years on the bench, and was the author of numerous legal works.

W. H. Brimson, formerly from February, 1904, to September, 1910, general superintendent of the Baltimore & Ohio Southwestern, died recently at his home in Washington, D. C., aged 65 years. Mr. Brimson began railway work in 1862 as messenger boy for the Cleveland & Toledo. Later he was consecutively secretary to superintendent, train despatcher, trainmaster and superintendent telegraph and superintendent of the Cincinnati, Sandusky & Cleveland, and subsequently was superintendent of the Duluth & Iron Range, assistant superintendent of the Northern Pacific, and from 1892 to August, 1895, superintendent of the Rocky Mountain division of the latter road at Missoula, Mont. From November, 1895, to June, 1896, Mr. Brimson was superintendent of the Brainerd & Northern Minnesota, and in May, 1897, he went to the Baltimore & Ohio Southwestern as division superintendent at Chillicothe, Ohio, which position he held until he was promoted to general superintendent in February, 1904.

RAILWAY DEVELOPMENT IN ARMENIA.—Work has been started on the construction of a line from Samsoon on the Black Sea inland to Sivas, a city of about 70,000 inhabitants, about 150 miles distant. It is also reported that work is progressing rapidly on the Constantinople-Bagdad railway which now extends from Aleppo to a point near Urfa in the province of Aleppo in Mesopotamia. Work is also progressing northward from Bagdad.

RAILWAY MUSEUM FOR CHINA.—The Chinese Minister of Communications has proposed to establish a railway museum in Peking for the purpose of diffusing railway knowledge among the Chinese people. The proposed museum will be under the administration of a certain technical expert who received his training in France. The intention of the Ministry is to educate Chinese officials and others as to the necessity of a network of railways in the Chinese Republic and also to show foreigners how railway enterprises are being pushed forward in the country at the present time. Although the museum is to be styled a railway museum, a department for the exhibition of telegraphic, postal and navigation articles may be added at some future time as they, also, are under the control of the Ministry of Communications. It is expected that the Ministry of Agriculture and Commerce will copy the idea and establish museums for agricultural and commercial exhibits.

Equipment and Supplies

LOCOMOTIVE BUILDING

THE DEATH VALLEY RAILROAD has ordered one consolidation type locomotive from the Baldwin Locomotive Works.

THE DELAWARE & HUDSON has ordered 15 consolidation and 10 Pacific type locomotives from the American Locomotive Company.

THE KNEELAND-WEST LUMBER COMPANY, Phillips, Wis., has ordered one prairie type locomotive from the Baldwin Locomotive Works.

THE CHICAGO & NORTH WESTERN, reported in an unconfirmed item in the *Railway Age Gazette* of April 17 as being in the market for 35 locomotives, is in the market for 15 Pacific type and 25 mikado type locomotives.

THE NEW ORLEANS & NORTHEASTERN, reported in the *Railway Age Gazette* of February 6 as being in the market for 4 Pacific and 6 mikado type locomotives, is now reported to be in the market for 3 Pacific and 3 mikado type locomotives.

THE ALABAMA GREAT SOUTHERN has ordered one superheater mikado type freight locomotive from the American Locomotive Company. This locomotive will have 27 x 30 in. cylinders, 63 in. driving wheels, a total weight in working order of 278,000 lb., and a steam pressure of 175 lb.

THE PHOENIX SAND & GRAVEL COMPANY has ordered one 4-wheel saddle tank locomotive from the American Locomotive Company. This locomotive will have 10 x 16 in. cylinders, 30 in. driving wheels, a total weight in working order of 38,000 lb., and a steam pressure of 165 lb.

CAR BUILDING

THE CHICAGO, MILWAUKEE & ST. PAUL will build about 500 box, flat and gondola cars at its own shops.

THE MAGNOLIA COTTON OIL COMPANY, Houston, Tex., has ordered 10 40-ton tank cars from the American Car & Foundry Company.

IRON AND STEEL

THE TEXAS & PACIFIC has ordered 175 tons of steel from the American Bridge Company.

THE ST. LOUIS & SAN FRANCISCO has ordered 142 tons of bridge material from the Virginia Bridge & Iron Company.

THE DULUTH, SOUTH SHORE & ATLANTIC has ordered 368 tons of steel from Frankman Brothers, Minneapolis, for viaducts, one at Brimley, Mich., and one at Middle River, Wis.

A LONG RAILWAY TUNNEL IN SOUTH AFRICA.—The South African Railways will soon have a two mile railway tunnel, considerably the longest in Africa, on the line between Maritzburg and Cedara.

NEW ROLLING STOCK FOR AUSTRALIAN RAILWAYS.—It is stated that there are now under construction for the Australian railways 1,000 cars and 180 engines. Of the latter 80 are being built in England and the remainder in Australia.

OFFICES OF THE SOUTH MANCHURIA RAILWAY.—The Japanese Chamber of Commerce at Mukden is doing its best to have the general offices of the South Manchuria Railway moved from Dairen to Mukden. It is doubtful that such a change will be made. It is argued, nevertheless, that since the close of the war the center of Japanese activity has shifted northward and consequently as Mukden is the center of a new network of railways it will be a more convenient place for the headquarters of the railway than Dairen, which is only a port.

Supply Trade News

The Chicago-Cleveland Car Roofing Company has removed its Chicago office from the Peoples Gas building to 535 Railway Exchange.

The Welding Materials Company, New York, has moved its office from 149 Broadway to the Engineering building, 114 Liberty street.

The Chicago office of the Falls Hollow Staybolt Company, formerly in the Old Colony building, is now located in the Fisher building, 343 S. Dearborn street.

The Union Railway Equipment Company has moved its offices from 1707 McCormick building to suite 624 McCormick building, 332 South Michigan avenue, Chicago.

George M. Black, treasurer of the Detroit Seamless Steel Tubes Company and the Monarch Steel Castings Company, and secretary of the Michigan Malleable Iron Company, all of Detroit, Mich., died in that city on May 5.

The Buffalo Foundry & Machine Company, Buffalo, N. Y., has terminated the arrangement whereby H. E. Jacoby has been representing it in New York City and vicinity. The company are now handling direct all inquiries covering vacuum apparatus, castings, patterns and machine work.

Richard F. Spamer has been appointed general manager of the Stentor Electric Manufacturing Company, Inc., New York, a recently-formed company which is now taking over the business of the Electrical Experiment Company of the same city. Mr. Spamer was born in St. Louis on March 29, 1878. He entered the employ of the Bell Telephone Company of Missouri in 1895, and worked in the inspection and traffic departments of that company until 1903. In that year he became superintendent of plant of the Consolidated Fire Alarm Company, Chicago, and while holding that position developed and patented an automatic sprinkler supervisory system and various other kinds of fire alarm equipment. In 1907 he entered the employ of the Western Electric Company and was connected with that company's New York office as railway telephone engineer at the time of his appointment to his present position. While he was in the employ of the company, also, he developed and patented a number of appliances used in telephone train despatching.

R. F. Spamer

The T. L. Smith Company, Milwaukee, Wis., has taken over the Chicago Mixer, which was formerly sold by the Chicago Concrete Machinery Company, Chicago, Ill. The machine which has been entirely redesigned will henceforth be known as the Smith-Chicago mixer, and will form a part of the T. L. Smith Company's regular line.

The 1,000 Great Northern refrigerator cars, order for which has just been placed with Haskell & Barker Car Company, will be equipped with the latest type Bohn, all steel, collapsible bulkheads manufactured by the White Enamel Refrigerator Company, of St. Paul. This company has also just completed a shipment of bulkhead material for 75 Great Northern express refrigerator cars now being built by the Barney & Smith Car Company.

W. Sharon Humes, for the past five years sales manager of the General Railway Supply Company, Chicago, has been retained by the Transportation Utilities Company, New York, which company acquired the entire business of the General Railway Supply Company on April 15, as noted in the *Railway Age Gazette* of April 25. Mr. Hume's office will be in Chicago, as heretofore; and he will represent the new company in all of the territory west of Pittsburgh.

TRADE PUBLICATIONS

METAL MOLDINGS AND SHAPES.—The Dahlstrom Metallic Door Company, Jamestown, N. Y., has issued an attractive catalog describing the Dahlstrom Quality Molding and containing actual size cross-section illustrations of the various shapes of moldings that can be supplied.

HYDRAULIC JACKS.—The Watson-Stillman Company, New York has recently issued Sectional Catalog No. 91 entitled Hydraulic Jacks and Lifting Tools. The booklet which contains not quite 100 pages gives views, brief descriptions and specifications of the various types of hydraulic jacks, jack accessories and parts made by the company, and is as usual very well done.

AUTOMATIC TELEPHONES.—The Automatic Electric Company of Chicago, has issued a pamphlet describing the intercommunicating automatic telephones in use at the Burnside shops of the Illinois Central, at the Kansas City Terminal, and also on the Louisville & Nashville. Figures covering cost data are given, together with curves showing the cost under various conditions of service for a number of lines.

EMERY WHEELS.—The American Emery Wheel Works, Providence, R. I., has issued a "Safety First" chart entitled "How to Prevent Grinding Wheel Accidents." The chart is meant to be hung upon the wall. It contains detailed analyses of the various types of grinding wheel accidents, the information being taken from "Grinding Wheels," compiled by the Independence Inspection Bureau, Philadelphia, Pa.

MOTORS AND GENERATORS.—Fairbanks, Morse & Company, Chicago, Ill., have recently issued the following bulletins describing the Fairbanks-Morse motors and generators: No. 210, Internal Starter Motors; No. 202 H, Standard Induction Motors; No. 27, Direct Current Motors and Generators, Commutating Pole Machines, Type "CP" and No. 29, Direct Current Motors and Generators, Commutating Pole Machines, Type "TRC."

RAILROAD STATISTICS.—Thompson, Towle & Co., 14 Wall street, New York, are distributing to their customers the second edition (1914) of the table showing the essential statistics of important railroads. The table is 26 in. x 13 in. and shows at a glance and in a very convenient way the capitalization, earnings, dividend rate, earnings on stock, etc., and certain averages per mile, together with the number of shareholders and the high and low stock quotations in six years. This is an excellently prepared table for ready reference.

AXLE LIGHT.—Bulletin No. 11 from the Consolidated Railway Electric Lighting & Equipment Company, Hanover Bank building, New York, tells of the development of the Consolidated axle light equipment and in an attractive manner describes fully the various details of the apparatus and the principal advantages which are claimed for it. While no radical changes have been made in the equipment, a number of important improvements have been made in the details. For instance, the dynamo has cast handhold covers instead of sheet iron covers, the pole changer has been strengthened and Timken roller bearings have been added.

STREET LOCOMOTIVE STOKER.—Catalog 14 from the Locomotive Stoker Company, Schenectady, N. Y., discusses briefly the advantages of the Street locomotive stoker and presents general views and important dimensions of a number of locomotives equipped with such stokers on the Baltimore & Ohio, Norfolk & Western, Chesapeake & Ohio, Hocking Valley, Virginian, New York Central Lines, Chicago, Burlington & Quincy and the Buffalo, Rochester & Pittsburgh. Then follow comments of the effect of the mechanical stoker on tonnage, steam pressure, capacity, speed train movements, cleaning fires, safety, reliability, labor and the fireman.

Railway Construction

CHARLESTON NORTHERN.—Work is now under way, it is said, building from Charleston, S. C., northeast to Andrews. Grading has been finished from Andrews to the Santee river and track laying is now in progress from the Charleston end. The company was incorporated last year in South Carolina to build through the counties of Georgetown, Berkeley and Charleston, about 57 miles. W. R. Bonsal, president, Hamlet, N. C. (December 19, p. 1,207.)

FAIRMOUNT & VEBLEN.—A contract has been let, it is said, to build an extension from Veblen, S. Dak., southwest to Webster, 40 miles. The work involves handling 1,000,000 cu. yd. of earth and 5,000 cu. yd. of rock excavation, also 1,000,000 cu. yd. of embankment. The company now operates a 46-mile line from Fairmount, N. Dak., southwest to Veblen, S. Dak. (September 26, p. 585.)

NORTH CAROLINA ROADS (Electric).—A conditional franchise has been granted by the city officers of Elizabeth City, N. C., to T. J. Markham, J. C. Commander and D. E. Williams, to build an electric street railway system. The promoters have already secured a right of way to build an electric line from Elizabeth City to Wade's Point, in the southern part of Pasquotank county; also rights of way to build north to South Mills, thence through Camden county to Norfolk, Va., in all about 100 miles.

OHIO ROADS (Electric).—Plans are being made, it is said, to build an electric line from Hillsboro, Ohio, northeast via Washington Court House to Columbus, about 65 miles. A. M. Fisher, Indianapolis, Ind., is said to be interested.

PACIFIC GREAT EASTERN.—An officer of this company, which started work in 1912 on a line from Vancouver, B. C., north to the Grand Trunk Pacific at Fort George, 480 miles, writes that track has been laid on 25 miles. P. Welch, Vancouver, B. C., is the general contractor. (March 27, p. 767.)

SEABOARD AIR LINE.—A contract has been given to A. F. Langford, Valdosta, Ga., it is said, to build an extension from Bartow, Fla., east via Alturas to a point six miles east of Lake Wailes, about 26 miles. A contract was given last year to Kiblin, Boswell & Company, Dunnellon, Fla., to build an extension from Bartow to Pembroke, 8.5 miles. (December 5, p. 1099.)

SOUTHERN NEW ENGLAND.—About 650 men are at work on the construction of this line between Palmer, Mass., and the Rhode Island line. Twelve steam shovels are now in service, together with several concrete outfits. The company has applied to the Rhode Island legislature for authority to lease its property to the Central Vermont, of which it is an extension.

TAKU RAILWAY & NAVIGATION COMPANY.—Incorporated in the state of Washington with $3,000,000 capital and office at Olympia, Wash. The plans call for building from Taku Inlet, B. C., to the British Columbia boundary, and the incorporators include W. B. Herr, W. Wilson and F. S. Bayley.

TENNESSEE, KENTUCKY & NORTHERN.—Rights of way are now being secured, it is said, to build the extension projected some time ago from Algood, Tenn., south via Cookeville to Sparta, about 20 miles. The company now operates a line from Algood north to Livingston, 19 miles. Plans have also been made to build an extension from Livingston north to Stearns, Ky. (January 17, 1913, p. 132.)

TOLEDO, OTTAWA BEACH & NORTHERN (Electric).—This company is making plans, it is said, to build an extension from Toledo Beach, Mich., north to Monroe, about 5 miles.

VIRGINIA-BLUE RIDGE.—Application will soon be made by this company for a charter in Virginia, to build from Tye river on the main line of the Southern Railway north to Massies Mill. The line will follow the Tye and Piny rivers in Nelson county. Owners of timber land along the proposed route are back of the project. It is understood that contracts will be let soon for carrying out the work.

WAYCROSS & WESTERN.—This company has under consideration the question of building an extension, it is said, from Milltown, Ga., west via Hahira and Pavo to Pelham, about 70 miles. The company now operates a 38-mile line from Waycross west to Sirmans and is building a 4-mile extension west to Milltown. (March 20, p. 704.)

WHEELING EASTERN.—Incorporated in West Virginia, with $10,000 capital, to build from Short Creek, W. Va., south to Clinton, thence east via Potomac to West Alexander, Pa., about 12 miles. The incorporators include B. L. Rosenbloom, Wheeling; M. E. McGrail, R. J. Smith and G. A. Feeney.

RAILWAY STRUCTURES

BIRMINGHAM, ALA.—An officer of the Louisville & Nashville writes regarding the construction of a viaduct on First avenue, Birmingham, that the company is about to prepare plans for building a reinforced concrete viaduct at that place. It has not yet been decided when bids will be asked for the work. (April 24, p. 967.)

BRANTFORD, ONT.—The Railway Commission of Canada has authorized the Lake Erie & Northern to build a bridge over the Western Counties canal at Brantford.

BOSTON, MASS.—An officer of the Boston Elevated writes that the company plans to build a bridge over the Mystic river on an extension of the elevated line to Everett. The bridge will include a bascule draw of 75 ft. clear width. The plans have been submitted to the public authorities for approval.

CHICAGO, ILL.—The Chicago & Illinois Western will receive bids up to noon Monday, May 11, 1914, for the structural steel of the Chicago & Illinois Western Railroad bridge over California avenue.

EVERETT, WASH.—The Great Northern has announced officially that it is about to start work on a tie preserving plant at Everett, Wash.

LONG ISLAND CITY, N. Y.—The Long Island Railroad has completed plans for a new passenger station to be built in Long Island City at Hunters Point avenue and Van Alst street, to take care of traffic via the Belmont tunnels. The work will begin shortly, and will probably be carried out by the railroad company's construction force. The plans call for the construction of an island platform about 240 ft. long, at the westerly end of which there is to be a building about 50 ft. long, and stairways will lead from Hunters Point avenue bridge down to the platform.

OCCOQUAN, VA.—A contract for the foundation and masonry of a bridge for the Washington Southern Railway has been given to John Monks & Sons, New York, and a contract for the steel work has been given to the Phoenix Bridge Company, New York.

OTTAWA, ONT.—Application has been made to the Canadian parliament for incorporation by the Ontario-Niagara Connecting Bridge Company to build a combined railway and highway bridge over the Niagara river, from a point within 6,000 ft. of the north boundary of the county of Welland.

PHILADELPHIA, PA.—Plans have been submitted by the Pennsylvania Railroad to the city officers of Philadelphia for proposed street and railway improvements in Overbrook and vicinity between fifty-second street and the county line. The work includes a complete change of several of the present highways of Overbrook. The old Lancaster pike, which now passes under the main line, will be abandoned, and two new and wide thoroughfares on the line of Malvern avenue and Fifty-ninth street, crossing the main line and a proposed freight yard between Fifty-second street and Malvern avenue by overhead bridges, are to be substituted. The plans also call for the opening of a number of new city streets. The proposed new freight yard is very large and is to be equipped for electric propulsion. The company's plans also include new main tracks for a considerable distance, to be used for freight, to relieve the passenger lines.

WHITING, IND.—The Pennsylvania Lines have purchased Berry Lake, Ind., and will convert it into a site for railroad yards and repair shops.

Railway Financial News

ANN ARBOR.—F. J. Lisman & Co., New York, have underwritten a new issue of $750,000 two year 6 per cent. notes, the proceeds of the sale of which is to be used by the railroad company to pay off an equal amount of one year 6 per cent. notes which fall due May 1. The new notes are secured by 470 steel underframe box cars, the entire outstanding improvement and extension mortgage 5 per cent. bonds which are in turn secured by second mortgage on the entire road and by a first mortgage on the new shops at Owosso, Mich.

CANADIAN NORTHERN.—The Montreal *Herald* prints the following summary of the agreement under which the Canadian government is to guarantee $45,000,000 additional bonds of the railroad company:

The union of all the companies (31 in all) in the Canadian Northern system by the transfer to the Canadian Northern itself of the stock of all the others.

The reduction of the capital stock of the companies thus united from about $145,000,000 to $100,000,000.

The guarantee by the government of Canada of $45,000,000 of securities of the Canadian Northern.

The transfer to the Dominion of Canada of $40,000,000 of stock (inclusive of $7,000,000 already owned by the Dominion government) as compensation for bond guarantee.

The government is protected by a mortgage from the Canadian Northern on its entire assets and from each of the other companies on which money shall be spent on its assets as security against its liability as guarantor.

Provision is made for supervision of the proceeds of the guaranteed securities to the end that they must be applied in the completion and betterment of the system.

Should the company make default either in respect of the securities now guaranteed or of any prior encumbrance, the government has power immediately to take over the road as an absolute property of the Dominion of Canada, subject only to bonded indebtedness.

Mackenzie, Mann & Company and Messrs. Mackenzie & Mann individually, release absolutely all claims against the Canadian Northern for construction profits, commissions or other considerations for transfers of stocks.

Mackenzie, Mann & Company bind themselves that floating indebtedness will be reduced to normal figures within one year without recourse to proceeds of guaranteed securities.

The government takes also as additional security the interest of Mackenzie, Mann & Company in Canadian Northern townsites.

CHICAGO, MILWAUKEE & ST. PAUL.—This company has asked the approval of the Illinois Public Utilities Commission for a proposed issue of $30,000,000 general and refunding mortgage bonds.

CHICAGO, ROCK ISLAND & PACIFIC.—E. W. McKenna, vice-president of the Chicago, Milwaukee & St. Paul, has made an inspection of the Chicago, Rock Island & Pacific, and made his report to the bondholders' protective committee. It is understood that this report estimates that about $60,000,000 will be required for additions and betterments to the property during the next five years exclusive of the new line between Kansas City and Chicago which will cost in the neighborhood of $7,000,000.

On May 1 the interest due on the collateral trust 4 per cent. bonds of the Railroad Company was defaulted.

LAKE SHORE & MICHIGAN SOUTHERN.—This company has sold in London and Paris about $20,000,000 one year notes dated May 15, the proceeds of these notes is to be used in part to reimburse the treasury for cash used in meeting notes due during the first four months of the year and to pay $10,000,000 notes due about May 15. The notes do not bear interest but are sold at a discount which yields the investor about 4½ per cent. on his money.

MISSOURI, KANSAS & TEXAS.—On May 1 under the agreement between the state of Texas and the Katy, the Missouri, Kansas and Texas of Texas took over under a 99 year lease the Beaumont & Great Northern, the Texas Central, the Wichita Falls & Northwestern, the Wichita Falls & Southern and the Wichita Falls & Wellington, a total of 446 miles.

This company, it is understood, is negotiating for the sale of about $800,000 equipment trust certificates.

MISSOURI PACIFIC.—On May 2 the *Wall Street Journal* printed the following: "It can be stated with authority that George J. Gould has offered his and the estate's holdings of Missouri Pacific stock at an attractive enough price to interest bankers." It is understood that negotiations are being carried on with Kuhn, Loeb & Company, New York, and that the agreement which Mr. Gould is probably trying to make is one which provides for the deposit of Gould stock with a trustee for a considerable period of years.

PENNSYLVANIA RAILROAD.—On April 1 there were 89,602 stockholders, the average holdings being 111.44 shares (par $5,572). This is an increase in the number of stockholders of 12,756 as compared with April 1, 1913. More than 48 per cent. of the total number of stockholders are women. There are 30,240 stockholders in Pennsylvania, 15,298 in New York, 16,612 in New England and 11,784 abroad.

ST. LOUIS & SAN FRANCISCO.—The appellate division of the Supreme Court of New York has reversed the lower court and vacated the injunction against the Guaranty Trust Company which had prevented this company from turning over to the Southern Railway the entire stock of the New Orleans Terminal Company. The New Orleans Terminal Company built the terminal in New Orleans which has been used jointly by the St. Louis & San Francisco and the Southern Railway, the terminal company having issued $2,000,000 stock and $14,000,000 bonds. The stock was held by the Guaranty Trust Company for the Southern and Frisco jointly under an agreement which provided that each road should pay half of the interest on the bonds which were outstanding in the hands of the public. This agreement also provided that if either road failed to pay the interest due the other road could and should make the total payment and the defaulting road would forfeit its interest in the stock of the Terminal Company, which should become the sole property of the road making the interest payment. The appellate division of the Supreme Court has upheld the validity of this agreement and has permitted the Southern to obtain from the trust company the $2,000,000 stock of the Terminal Company because of the failure of the receiver of the Frisco to pay $140,000 which represented its share of the interest due on the Terminal bonds.

SOUTHERN PACIFIC.—About $16,000,000 of the $55,000,000 5 per cent. 20-year bonds, which was recently taken by a syndicate and offered to the public, remains unsold. The syndicate agreement expires July 22. The rights of stockholders to subscribe to these bonds expired on April 22.

SOUTHERN RAILWAY.—See St. Louis & San Francisco.

UNION PACIFIC.—The appellate division of the Supreme Court of New York has confirmed the order of Justice Greenbaum of the Supreme Court refusing to grant an injunction restraining the Union Pacific from distributing its Baltimore & Ohio stock to its common stockholders. (See *Railway Age Gazette*, April 10, 1914.)

STEEL CARS FOR THE RUSSIAN RAILWAYS.—The Russian Ministry of Ways of Communication has decided to order the construction of some steel underframe passenger cars patterned after American models. It is expected that if these cars prove successful, some all-steel cars will also be built.

RAILWAY CONCESSIONS IN THE RUSSIAN FAR EAST.—Concessions have recently been granted for the construction of a railway from Station Manchuria, at the junction of the Chinese Eastern and Transbaikal lines to Urga, and for a line likewise from Station Manchuria to Nerchinsk Lavod and Stretensk. Some doubt has been expressed, however, concerning the availability of funds for carrying out the projects.